SUPPLEMENT TO

'Flora of Southern British Columbia'

(J. K. Henry)

by

J. W. Eastham

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Special Publication No. 1, British Columbia Provincial Museum

Victoria, B. C.

1947

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SUPPLEMENT TO

'Flora of Southern British Columbia'

(J. K. Henry)

comprising

descriptions of additional species and varieties, significant extensions of range, and corrections

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Department of Education

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FOREWORD

The "Flora of southern British Columbia and Vancouver Island" by J. K. Henry was published in 1915. In the 32 years since that date, new roads and railways have opened up many areas which were previously inaccessible to the ordinary traveller, and while, unfortunately, botanical collectors have never been numerous in the Province, a good deal of new material has accumulated in our herbaria, or has been recorded in literature. It was thought, therefore, that pending a new edition of Henry's "Flora", a supplement to that work, giving descriptions of additional species now known to occur, as well as certain corrections and the more important taxonomic changes which have been made in the interval, would be of service to students, and would stimulate further collection and study.

The original plan was much simpler than the one now attempted, being merely to list, with descriptions, those additional species actually represented by specimens in the five institutional herbaria of the Province, viz., Provincial Museum, Victoria; University of British Columbia, Vancouver; Provincial Department of Agriculture (Vancouver Office); that formed by Mr. G. V. Copley in the offices of the Grazing Commission at Kamloops; that formed by Mr. E. W. Tisdale at the Dominion Range Experiment Substation, Kamloops; with an indication in which herbaria the rarer plants were located.

However, it seemed much would be lost by ignoring the records in such comprehensive works as Hitchock's "Manual of Grasses" and Mackenzie's "Carex", or such an intensive regional study as Ulke's "Flora of Yoho Park", and in the end it was decided to make the record as complete as feasible. However, neither time nor library facilities have permitted an exhaustive search of the literature, nor has it been possible to examine the National Collection at Ottawa, where much British Columbia material is preserved, although the Curator, Mr. A. E. Porsild, has kindly supplied some data. The original plan of indicating in which herbaria the rarer plants are located has been retained, as this may be of service to those working on taxonomic revisions.

The area covered by the supplement is much the same as that of the "Flora", but the northern limit has now been somewhat more fully examined. This limit may be taken as the country immediately adjacent to the northern line of the Canadian National Railway. This enters the Province from Alberta in lat. 53, reaches lat. 55¼ at Hazelton, and ends at Prince Rupert in lat. 54, bisecting the Province into two approximately equal parts. A number of records are given from easily accessible points 20 to 30 miles north of the railway and one or two from still farther north, but otherwise no attempt has been made to include the northern area. There is a certain amount of material in our herbaria from this region, especially from the Atlin district, and there is probably more in the National Herbarium, but it will probably be many years before there is adequate material for a "Flora " of this region, and it has been thought best for the present to abide by the limits of Henry's "Flora". The Peace River area has also been excluded, since its botanical affinities are rather with the Prairie Provinces than with British Columbia west of the Rocky Mts. Also, the writer has never visited it and material in our herbaria is scanty.

Grateful acknowledgment is here made to the many persons who have helped in making possible this publication: to Dr. J. B. Munro, Deputy Minister of Agriculture, for his interest in the work and for the time allowed from other official duties to bring it to completion; to Dr. G. C. Carl, Director of the Provincial Museum, and his predecessor, the late Mr. F. Kermode, for facilities in the use of the collections, records and library in

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that institution, and to Mr. G. A. Hardy, Botanist to the Museum, with whom the writer has been in constant communication; to Professor J. Davidson for similar privileges in regard to the University, and to Dr. T. M. C. Taylor, also of the University, who has checked the writer's collection of Pteridophytes and furnished many references in literature.

To Dr. H. T. Güssow, former Dominion Botanist, and the staff of the Division of Botany, Central Experimental Farm, Ottawa, especially Dr. H. A. Senn, Mr. H. Groh and Dr. J. H. Soper, the writer is indebted for identifications, records, the loan of specimens in the herbarium of the Division, and descriptions of species not accessible to him here.

Nearly all the new records have been determined or the determination verified by extra-provincial botanists. Mr. Copley's plants were mostly identified by the late Professor C. V. Piper, those of the Provincial Museum by various botanists of the Pacific Slope and specialists, whom it is not necessary to list here, but the writer wishes to thank those who have rendered this service in the case of his own collections, now in the herbarium of the Department of Agriculture. These include Dr. C. R. Ball (*Salix*); Dr. A. A. Beetle (*Scirpus*); Dr. S. F. Blake (*Compositae*); Dr. J. F. Brenckle (*Polygonum*); Dr. F. J. Herman (*Cyperaceae* and *Juncaceae*); Dr. F. W. Pennell (*Castilleja* and *Pedicularis*); Mr. A. E. Porsild (northern plants especially); Mr. J. R. Swallen (*Gramineae*); and Dr. R. McVaugh and others of the United States Department of Agriculture for various identifications.

A word of appreciation is also due to those collectors who have added to our knowledge and our collections. On the Lower Mainland Messrs. R. Glendenning, P. P. Henson, F. Perry and W. Taylor deserve mention, the two latter especially for their collections of the high alpine flora. In the Interior, Mr. Harold Murray of Crawford Bay, Kootenay Lake, has collected intensively over a period of years in that district, and contributed many speciments; Mr. W. B. Johnstone of Cranbrook has made some interesting finds in that area; Mr. W. C. McCalla of Calgary, Alberta, has contributed an interesting set of plants collected in the eastern part of the Province, including several rare or new to our flora. Other names are given with the plants they have found.

There have been extensive changes in nomenclature in recent years, many of which are given in this supplement, but no attempt at a complete revision has been made and a genus has rarely been re-opened for changes in nomenclature alone. It should, perhaps, be mentioned that in entries of the type *P. densa*=**Cheilanthes siliquosa** Maxon (under *Pellaea*) the first name is that used in Henry's Flora.

In conclusion it should be emphasised that this is an interim publication. Since its preparation was begun, Henry's "Flora" has become completely out of print and a new edition or a new "Flora" will have to be undertaken in the near future. Corrections or criticism will be welcomed, but especially, records of species not given either in the original work or the supplement. Such material will be carefully filed for the use of whoever shall undertake this work, whether the present writer or another.

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J. W. EASTHAM.

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HERBARIA

Can. Canadian National Herbarium, Ottawa.
DA. Provincial Department of Agriculture, Court House, Vancouver, B. C.
DB. Division of Botany, Central Experimental Farm, Ottawa.
EWT. Dominion Range Experiment Substation, Kamloops, B. C. (E. W. Tisdale); now removed to Swift Current, Sask.
GVC. Herbarium formed by G. V. Copley at offices of Grazing Commission, Kamloops; now in Kamloops High School, B. C.
PM. Provincial Museum, Victoria, B. C.
Pullman. A collection made in B. C. by a party of botanists from the State College of Washington, Pullman, in 1941. A nearly complete set is in the Provincial Museum, Victoria.
U. University of British Columbia, Vancouver, B. C.

OPHIOGLOSSACEAE

BOTRYCHIUM

B. lanceolatum (S. G. Gmelin) Angstr. Our western plant is referred by recent authors to the sp. and not to var. *angustisegmentum* Pease & Moore. *B. ramosus* (Roth.) Aschers.=*B. matricariefolium* A. Br., not known to occur w. of the Rocky Mts. The sp. under the former name appears to be **B. boreale** (Fries) Milde (*B. pinnatum* St. John). Not common; Upper Skagit Valley (U); Toad Mt., Nelson (DA); Perry Creek, Cranbrook (DA).

OPHIOGLOSSUM

Small herbaceous perennials with short, usually erect, fleshy rhizomes. Leaves erect, glabrous, fleshy, arising at the side of the apical bud; sterile blade simple, sessile or short-stalked, with reticulate venation; sporophyll a simple, slender, long-stalked spike; sporangia marginal in 2 ranks, large, globose, transversely dehiscent.

O. vulgatum L. Fronds usually solitary, 1-4 dm. tall, sterile blade entire, usually sessile, lanceolate to elliptic or ovate, 2.5-12 cm. long, 1-5 cm. broad, obtuse to acutish; sporophyll 12-30 cm. long, the fertile part 2-4 cm. long, apiculate, bearing 10-30-(50) pairs of sporangia.

Widely distributed in Eurasia and eastern N. Am., but very rare on the Pacific Slope. It has been collected at Unalaska and at two or three stations in Wash. The only B. C. plants I have seen (DA) came up in the rock-garden of H. Murray, Crawford Bay, in a "pocket" where gentians from the Monashee Mts. had been grown. However, as the garden contains plants from various sources, the evidence of a B. C. origin for them is inconclusive.

POLYPODIACEAE

ADIANTUM

A. capillus-veneris L. Frond with a continuous main rachis, ovate-lanceolate, 1-5 dm. high, 2-3-pinnate at base, simply pinnate above; pinnules wedge-obovate or rhomboid, 5-30 mm. long, deeply and irregularly incised; sori mostly oblong-lunate. Warm temperate or subtropical regions of both hemispheres. Commonly cult, in greenhouses. Abundant around hot springs, runnels and flumes, Fairmont Hot Springs. Possibly introduced, as the nearest stations are in Utah and S. Calif. but there is no record of this among the local residents. The station has been known for over 30 years.

ATHYRIUM

A. filix-femina (L.) Roth. seems generally accepted as the name of our common Lady-fern. (*Athyrium cyclosorum* Rupr.; *Asplenium cyclosorum* of Henry not of Rupr.)

A. alpestre (Hoppe) Rylands var. **americanum** Butters

A. americanum (Butters) Maxon

Phegopteris alpestris (Hoppe) Mett. in Henry.

CHEILANTHES

C. siliquosa Maxon=*Pellaea densa* (Brack.) Hook.

Not common; Garibaldi (U); Sicamous (Macoun); Rossland (DA); Kootenay Bay, Kootenay L. (DA).

C. Feei Moore. Said by Henry to be common east of the Cascades, but the writer has not found it so. It is abundant in limestone cliffs above Fairmont Hot Springs (DA) but the only other records in our herbaria are Chilcotin (PM) and Deadman's Creek, w. of Kamloops (Pullman).

CYSTOPTERIS

C. montana (Lam.) Bernh. According to Porsild (Can. Field Nat. **54:** 54. 1940) only two new Canadian stations have been reported since Macoun published his Catalogue (1883-1890). The writer found it abundant by the side of a waterfall just w. of Kinbasket L., on the Big Bend Highway (DA).

DRYOPTERIS
(*Aspidium*)

D. cristata (L.) A. Gray. Swamp at Kitchener, W. B. Johnstone (DA).

A. rigidum Hoffm. var. *arguta* (Kaulf.) Underw.=**D. arguta** (Kaulf.) Watt. Occurrence in B. C. doubtful.

D. marginalis (L.) A. Gray. Rootstock stout, woody, ascending, densely covered with bright brown scales, the leaves in a crown; stipe 1-2.5 dm. long, chaffy below; blades ovate-oblong or ovate-lanceolate, almost coriaceous, 2-7 dm. long, nearly or quite 2-pinnate, acuminate, usually a little narrowed at the base; pinnae numerous, sessile or nearly so, glabrous, 5-12 cm. long, the lowermost unequally deltoid-lanceolate, others lanceolate to broadly oblong-lanceolate, acuminate; segments oblong or lanceolate, obtuse or subacute, falcate or subfalcate, subentire, crenate or pinnately lobed, partially adnate or the lowest distinct; sori distant, close to margin; indusium orbicular-reniform, glabrous. N. S. to B. C. and southwards e. of the Rocky Mts. Atlin (PM).

D. nevadensis (D. C. Eaton) Underw.

D. oregana C. Ch.

Rhizome slender, creeping; fronds few, 5-9 dm. long; stipes slender, much shorter than the blade, nearly naked; blades elliptic-lanceolate, acuminate, 4-6 dm. long, 10-16 cm. broad, long-attenuate to a very narrow base; pinnae sessile, linear to oblong-linear, acuminate to subcaudate, the basal ones usually distant, minute, pinnatifid; segments about 2 mm. broad, close, oblong, obtuse or acutish, slightly oblique, membranous, entire or obscurely crenate, minutely resinous-glandular; veins oblique, mostly simple, slightly hairy beneath: sori small, submarginal; indusium minute, long-ciliate, glandular. Ore.-Cal. Sooke, V.I. (PM).

ONOCLEA

The name *O. Struthiopteris* is not applicable to our Ostrich Fern, but the valid name appears to be in doubt. **Struthiopteris filicastrum** All.,

Pteretis pennsylvanica (Willd.) Fern. and **P. nodosa** (Michx.) Nieuwl. are all used in recent publications, the last, perhaps, most commonly. This sp. is uncommon in the south; Chilliwack; Hope; Lumby; Revelstoke; sparingly at Quesnel and abundant in the Prince George district.

PELLAEA

P. densa=**Cheilanthes siliquosa** Maxon. Although *P. glabella* Mett. and var. *occidentalis* (Nels.) Piper have been reported for B. C. it seems probable that our only form is **P. Suksdorfiana** Butters (*P. glabella* var. *simplex* Butters).

POLYSTICHUM

P. Andersoni Hopkins. Fronds 4-11 dm. long; stipe 5-25 cm. long sulcate, scaly; blades nearly 2-pinnate, narrowly lance-oblong to lance-elliptic, long-acuminate, 8-20 cm. broad at the middle, *proliferous by scaly buds below the tip;* pinnae numerous, narrowly triangular, nearly pinnate at the base; segments elliptical, strongly serrate, teeth long-awned; sori large, 2-6 pairs, nearly medial; indusium erose-dentate, the teeth gland-tipped. Alaska to Wash. e. to Montana. Type collected by W. B. Anderson at Strathcona Park, V.I. Forbidden Plateau, V.I. (DA); Mt. Waddington (PM); Alice Arm, lat. 55, (PM).

P. scopulina (D. C. Eaton) Maxon. Bridge River Mts. (DA); Coquahalla (DA).

WOODSIA

W. ilvensis (L) R. Br. Okanagan (U); 150 mile House, Cariboo Road (U).

W. Cathcartiana Robinson. Finely glandular-puberulent but without the flat white hairs of *W. scopulina* which it most resembles; fronds dull green, firm, lanceolate, bipinnatifid; pinnae oblong, the lower distant; segments usually separated by wide sinuses, oblong-denticulate; indusium concealed beneath the sorus, reduced to rather long fine hairs. Anarchist Mt., Osoyoos (DA).

W. glabella R. Br. Rootstocks small, ascending, densely clustered; stipe very slender, usually straw-colored, jointed above the base; blades delicate, linear or narrowly lanceolate, 3-16 cm. long, 8-16 mm. wide, once pinnate; pinnae deltoid to roundish ovate, crenately lobed, glabrous, the lower remote, obtuse, often somewhat smaller than the middle ones; sori few, distinct or with age confluent; indusium minute with 6-10 hair-like, incurved or radiating segments. Wet rocks, Labrador to Alaska, s. to N.Y. and B. C. Horsethief Creek, Windermere (Ulke).

WOODWARDIA

W. fimbriata Sm.

W. Chamissoi Brack.

W. spinulosa Mart. & Gal .in Henry. Saanich Arm, V.I. (PM); Lasqueti Island (DA).

MARSILIACEAE

Perennial herbaceous plants, rooting in mud, with slender creeping rhizomes. Leaves long-petioled and with 2- or 4-foliate blades or filiform without blades. Sori in hard, several-celled sporocarps, arising from the rhizome near bases of the leaf-stalks, or more or less consolidated with them, and containing spores of two kinds, megaspores and microspores.

MARSILIA

Plants of shallow ditches, ponds and marshes. Leaves 4-foliate. Sporocarps with 2 teeth near the base, 2-celled vertically, with many transverse partitions, splitting into 2 valves at maturity.

M. vestita Hook. & Grev. Plant clover-like; rhizomes wide-creeping; leaflets broadly cuneate, usually hairy, entire, 5-15 mm. long and broad, petioles 2-11 cm. long, peduncles free from the petiole, very short; sporocarps solitary, 4-8 mm. long, 3-6 broad, hairy when young, upper basal tooth acute, rather long. B. C. to Calif. and eastwards. Indian Reserve, Kamloops, J. Macoun (PM); collected in 1889; not reported in recent years.

SALVINIACEAE

Aquatic floating plants bearing minute, apparently 2-ranked leaves, on a more or less elongate, sometimes branching axis. Sporocarps 2 or more on a common stalk, soft, 1-celled, thin-walled, each containing a central, often branched receptacle, which bears either megasporangia, each with a solitary megaspore, or microsporangia containing numerous microspores.

AZOLLA

Small, often reddish, moss-like plants with pinnately branched stems bearing rootlets on the underside. Leaves imbricate, 2-lobed. Sporocarps borne in pairs beneath the stem, some small, ovoid or acorn-shaped, containing at base a single megaspore with a few minute bodies above it; larger sporocarps globose, with a basal placenta, bearing many stalked microsporangia containing masses of microspores (*massulae*) each with rigid, linear, flattish processes with anchor-like tips (*glochidia*).

A. filiculoides Lam. Glochidia not septate, or rarely with 1-2 septa at apex; plants elongate, frequently 2-6 cm. long, with closely appressed, imbricate, papillose, oblong to ovate leaves, 1 mm. long, microsporangia 35-100 in an indusium; massulae 4-6; megasporangia with raised irregularly hexagonal markings. Guatemala to Alaska (H. K. Svenson).

A. mexicana Presl. Glochidia many-septate; plants dichotomously branched, 1-1.5 cm. diam. with upper leaf-lobes 0.7 mm. long, the under ones much larger; microsporangia usually with 4 massulae; megaspore pitted. French Guiana & Bolivia n. to Utah & B. C. and e. to Wisc. & Ill. Sicamous (H. K. Svenson).

EQUISETACEAE

EQUISETUM

E. Telmateia Ehrh.=**E. maximum** Lam.

E. ramosissimum Desf. is a Eurasian sp. and American records are believed to be erroneous.

E. scirpoides Michx. given in Henry only from "Golden; Rockies" is widely distributed in the Interior; Kamloops; Jesmond; Nelson; Kaslo; Ootsa Lake.

E. hyemale L. is an Old World form. *E. hyemale* var. *intermedium* A. A. Eaton=**E. laevigatum** A. Br. The sp. given under *E. laevigatum* A. Br. in Henry appears to be *E. laevigatum* A. A. Eaton=**E. kansanum** Schaffn. *E. robustum* A. Br.=**E. praealtum** Raf. and **E. hyemale** var. **californicum** Milde also occur in B. C.

The following is a key to the above sections;—

A. Spikes blunt or barely acute; aerial stems annual, similar; fertile stems mostly unbranched, sometimes (towards maturity) developing whorls of small branches ..... *E. kansanum*

AA. Spikes rigidly apiculate; aerial stems evergreen, persisting 2 or more years; 16-48-angled; central cavity more than half the diameter of the stem.

B. Sheaths much longer than broad, dilated above, somewhat funnel-shaped, mostly green, the lower ones with a dark band *E. laevigatum*

BB. Sheaths nearly or quite as broad as long, nearly cylindrical, tight, mostly ashy at maturity, with 2 dark bands

C. Ridges of the stem with a row of elevated cross-bands of silica; leaves sharply 3-keeled, the central keel rarely grooved *E. praealtum*

CC. Ridges of the stem usually with 2 distinct rows of silica tubercles; leaves 4-keeled, the central groove narrow but usually distinct ..... *E. hyemale californicum*

LYCOPODIACEAE
LYCOPODIUM

L. inundatum L. Not common; Shadow L. Garibaldi (DA); Loup L. near Aleza L. lat 54 (DA).

SELAGINELLACEAE
SELAGINELLA

S. apoda (L.) Fern.
S. apus (L.) Spring.
Annual, light green; stems prostrate, creeping, 2.5-10 cm. long, much branched, flaccid; leaves minute, of two kinds, 4-ranked, spreading in two planes; upper leaves of the lower plane spreading, the lower reflexed, ovate, acute, serrulate, not distinctly ciliate; leaves of the upper plane ovate, short-cuspidate; spikes 6-16 mm. long, obscurely quadrangular; bracts ovate, acute, sometimes serrulate, acutely keeled in the upper half; megaspores more abundant towards base of spike. Moist shady places, often amongst grass; Maine to B. C. (Broun).

S. Douglasii (Hook. & Grev.) Spring. Stems prostrate, wide-creeping, 15-35 cm. long, rooting throughout; main branches alternate, often elongate, rooting or not, distant, with about 3-6 flat, assurgent divisions, these 1-3-divided, leafy throughout; leaves in 4 ranks, distant, spreading, concave above, yellowish-green, oval-oblong, 2-3 mm. long, 1-1.8 mm. broad, rounded-obtuse, long-ciliate at the unequally auriculate base; leaves of the upper plane smaller, narrowly rhombic-ovate, cuspidate; spikes numerous, sharply quadrangular, 5-15 mm. long; sporophylls closely imbricate, cordate-ovate, acuminate, membranous, sharply keeled. Moist shady rocks and banks, B. C. to Calif. (Abrams).

S. scopulorum Maxon. Stems prostrate, short-creeping, 3-6 cm. long, pinnately branched, subcaespitose, forming large mats; branches numerous, close, the sterile ones mostly 5-15 mm. long, ascending, simple or with several very short oblique divisions; leaves arranged radially in many ranks, appressed-imbricate, those on underside largest, chartaceous, linear to lanceolate, apex obtuse, 2.4-3.25 mm. long including seta, 0.3-0.6 wide; seta 0.3-0.6 mm. long, stiff, scabrous, whitish hyaline from a lutescent base; cilia 4-8 (-11) on each side, mostly oblique and incurved; spikes numerous, 10-25 mm. long, slender, suberect; sporophylls coriaceous, deeply concave, broadly ovate, long-acuminate, mostly 2.2-2.8 mm. long including seta, 1-1.3 mm. wide, cilia usually 8-15 on each side, stout; megaspores subglobose, yellow, about 0.4 mm. diam.; microspores orange, about 0.05 mm. diam. Open rock slopes, B. C. to e. Ore. and Colo. Ootsa Lake (PM); Paradise Mine, Windermere (PM).

S. Standleyi Maxon. Stem prostrate, 6 cm. long or less, rooting, pinnately branched; leaves crowded, rigidly appressed, dull green or bronze, oblong-linear, 2-2.5 mm. long with 10-15 cilia on each side; apical seta 0.6-0.8 mm. long, lutescent, coarsely serrulate-scabrous; spikes numerous, 7-11 mm. long,

mostly in pairs; sporophylls deltoid to deltoid-ovate, about 2 mm. long and 1 wide, acuminate, setigerous at the acutish tip; cilia 16-21 on each side; megasporangia few, basal; megaspores orange-yellow, about 0.5 mm. diam., oblate-spheroidal, rugose in all aspects; microsporangia very numerous; microspores dull orange, about 0.03 mm. diam. Rocky Mt. region of Alta., B. C. and Montana. Yoho Lake at c. 6200 ft. (Ulke); Horsethief Creek, Windermere (Ulke).

SPARGANIACEAE
SPARGANIUM

S. fluctuans (Morong) Robinson. Leaves 7-12 mm. broad, slightly if at all keeled; inflorescence usually branched, each of 2 or 3 branches bearing 3-5 heads, usually 1-3 of the lowest fertile; these when mature 2 cm. diam.; style persistent, strongly curved; outer coat of nutlet firm and not easily separated. Maine & Conn. to Minn. Pond near Garibaldi railway station (DA); Creston Flats (DA). These specimens are referred with some hesitation to this eastern sp. However, the stout, strongly curved (almost semicircular) style and the firm adherent epicarp seem definitive.

NAIADACEAE
POTAMOGETON

P. heterophyllus=**P. gramineus** L.

P. zosterifolius=**P. zosteriformis** Fern.

P. panormitanus Biv. Close to **P. pusillus** with which it has been confused. Differs in having tubular (not flat) stipules; absence or very scant development of the lacunae bordering the midrib of the usually firmer leaves; peduncles more elongate; more elongate and very interrupted spikes with 3-5 whorls of fls.; fruit smoother, paler, beak more slender, sides usually somewhat concave. Both vars. extend across the continent.

var. **major** G. Fischer.....larger, or primary, leaves 1-3 mm. wide.

var. **minor** Biv.....larger, or primary, leaves 0.3-1 mm. wide.

P. vaginatus Turcz. Close to **P. pectinatus**; stem slender but not filiform, compressed; leaves linear, 0.5-2 mm. wide, up to 3 dm. long, stipules adnate to the petiole, the free tips very short and triangular or setaceous, about 1 cm. long; peduncles filiform, 5-10 cm. long; spikes 3-5 cm. long, interrupted; nutlets 2.5-3 mm. long, beakless, without keel or lateral ridges. Widely distributed in the northern hemisphere.

JUNCAGINACEAE
SCHEUCHZERIA

S. palustris L. Not common; Lulu Is., Vancouver (U); Loup L, near Aleza L. (DA); Horsethief Creek, Windermere (Ulke).

HYDROCHARITACEAE

Aquatic herbs with dioecious or polygamous regular flowers, sessile or pedunculate from a spathe; stamens 3-12, distinct or monadelphous; ovary 1-3-celled, stigmas 3 or 6; fruit indehiscent, many-seeded, ripening under water.

ANACHARIS
(*Elodea*)

Submerged plants with soft, elongate, branching stems. Leaves narrow, 1-veined, translucent, opposite or whorled. Flowers perfect or dioecious, subtended by a 2-cleft spathe; staminate flowers often deciduous at anthesis and floating to the surface; pistillate and perfect ones reaching the surface by a stipe-like perianth-tube, stigmas 3.

A. canadensis (Michx.) Planch. (WATERWEED). Middle and upper leaves in whorls of 3, imbricate above, usually ovate-oblong, 6-12 mm. long, 1-5 mm. wide; staminate fl. remaining attached by means of a long, filiform peduncle and with an oblong-linear spathe 11-13 mm. long; sepals or mature bud of pistillate fls. 2.3-2.7 mm. long. Que to Sask. & Wyo. and s. to N. Y. & Kentucky. Burnaby L. (DA); Crawford Bay, Kootenay L. (DA). These specimens are without fls. and have been referred here since some leaves are 2.5-3 mm. wide.

A. occidentalis (Pursh) Vict. (ROCKY MT. WATERWEED). Differs from the last in having leaves only 0.7-1.8 mm. wide (averaging 1.3 mm.) and not imbricated above; spathe of staminate fl. globose, the body about 2 mm. long, the staminate fl. sessile, breaking out of the spathe and rising free to the surface; sepals or mature bud of pistillate fls. 1.2-1.8 mm. long. Maine to Ore. s. to DC., Mo., & Neb. May occur in eastern B. C. as St. John records it from Coeur d'Alene, Ida.

*GRAMINEAE
AGROPYRON

A. cristatum (L) Beauv. (CRESTED WHEAT GRASS). Densely tufted, *without rhizomes*; spike dense, mostly 4-6 cm. long; *spikelets compressed, closely imbricate,* somewhat spreading, 5-15 mm. long; glumes firm, keeled, tapering into a short awn; lemmas somewhat abruptly narrowed into an awn 2-4 mm. long. A native of the Russian steppes, introduced into the Dry Belt on account of its drought-resisting qualities.

A. dasystachyum (Hook.) Scribn. *From creeping rhizomes;* culms mostly 40-80 cm. tall; blades flat to involute, 1-3 mm. wide, spikes mostly 6-12 cm. long; spikelets loosely to closely imbricate, 4-8-fld., 1-1.5 cm. long, the rachilla pubescent on the convex side; *glumes acute or awn-pointed,* scabrous or pubescent (usually less pubescent than the lemmas), 6-9 mm. long; *lemmas densely to sparsely pubescent,* sometimes nearly glabrous, *awnless* or mucronate, about 1 cm. long; palea almost as long as the lemma, obtuse. Plains and sandy shores, Mich. to B. C. and s. to Ill. and Ore. Merritt (G.V.C.); Canal Flats, Columbia Valley (DA).

A. Elmeri Scribn. Resembling **A. dasystachyum** but culms on the average taller, more robust, the spike longer (up to 25 cm.), spikelets larger (up to 10-fld. and 2.5 cm. long); glumes and lemmas usually longer (as much as 13 and 15 mm. respectively); lemmas pubescent, sometimes only on margins at base, or merely scabrous. Dry or sandy soil, B. C. to Ore.

A. riparium Scribn. & Sm. Resembling **A. dasystachyum** but blades usually narrower, spikelets usually more imbricate, lemmas typically glabrous but may be somewhat pubescent along the edges at the base. Dry or moist meadows and hills, N. D. to Alta. & Wash., s. to Ore., Ariz., and Colo. Between Elko and Frank (Pullman).

The above three sp. intergrade and may, perhaps, be regarded as forms of one polymorphic sp.

A. inerme (Scribn. & Sm.) Rydb. *A. spicatum* var. *inerme* Heller. Differs from **A. spicatum** chiefly in the spikelets being awnless. A common "bunch grass" of the Interior.

A. latiglume (Scribn. & Sm.) Rydb. *Tufted, without rhizomes,* culms curved or geniculate below, 20-50 cm. tall; blades flat, short, 3-5 mm. wide, pubescent on both surfaces; spikes mostly 3-6 cm. long, sometimes longer; spikelets usually closely imbricate; glumes rather broad and flat; *lemmas*

*The descriptions and ranges of these grasses are, in the main, those of Hitchcock's Manual. An attempt has been made to indicate what may be regarded as "key characters" by italics.

pubescent, awnless or nearly so. Alpine regions, Montana to Labrador and Alaska. Sparingly in screes of Black Tusk, Garibaldi, at about 6000 ft. (DA).

A. occidentalis Scribn.=**A. Smithii** Rydb.; common in the Dry Belt. var. **molle** (Scribn. & Sm.) Jones, has the lemmas, and sometimes the glumes, pubescent.

The species given as *A. caninum, A. tenerum,* and *A. biflorum* in Henry have been variously revised since that date. The following classification seems to find favor at present:—

A. trachycaulum (Link) Malte; leaves flat (involute in **A. spicatum** and **A. inerme**), awns of lemma wanting or short. (*A. tenerum* Vasey; *A. pauciflorum* [Schw.] Hitchc.) High alpine forms with shorter, denser, purplish spikes have been named *A. violaceum* (Hornem.) Lange. var. **unilaterale** (Cassidy) Malte; lemma with a straight awn 1-3 cm. long. (*A. caninum; A. subsecundum* [Link] Hitchc.)

There are several other named vars. and forms.

AGROSTIS

A. hyemalis (Walt.) BSP. is now considered to be an eastern sp. distinct from our **A. scabra** Willd.

A. aequivalvis Trin. Not common; Hollyburn Ridge, W. Vancouver, at ca. 3500 ft. (DA); Calvert Island (PM).

A. Thurberiana Hitchc.

A. atrata Rydb.

Much commoner than the last; Mt. Arrowsmith, V. I.; Forbidden Plateau, V. I.; Hollyburn Ridge, W. Vancouver; Garibaldi; Monashee Pass; Kokanee; Yoho; Mt. Revelstoke.

A. diegoensis Vasey. Culms erect, as much as 100 cm. high, from creeping rhizomes; blades flat, lax, 2-6 mm. wide; panicle narrow, open, 10-15 cm. long, the branches ascending, rather stiff, some of them naked below; spikelets about as in **A. pallens,** awned or awnless. Differs from **A. pallens** chiefly in the larger size and open panicle. Meadows and open woods at low and medium altitudes, Mont. and B. C. to Calif. and Nev.

A. idahoensis Nash. *Perennial;* glabrous; culms slender, tufted, without rhizomes, 10-30 cm. tall; leaves mostly basal, the blades narrow, flat; *panicle open but scarcely diffuse,* 5-10 cm. long; lemma about 1.3 mm. long, *awnless;* palea minute. Differs from **A. scabra** in the narrower, less diffuse panicle with shorter, broader and smaller spikelets. Mt. meadows at medium and high altitudes, w. Mont. to Wash. s. to N. Mex. and Calif.; Alaska. Gentian Ridge, Garibaldi (PM); Uplands, Victoria (PM).

A. interrupta L. *Annual;* culms smooth, 20-50 cm. tall; leaves short, flat, scabrous, 1-2 mm. wide; *panicle narrow,* exserted, *interrupted,* 6-18 cm. long, branches, or some of them, spikelet-bearing to the base; *rachilla prolonged beyond the palea as a minute bristle*; glumes unequal, lanceolate, acuminate, broadly hyaline-margined, 2-2.5 mm. long; *lemma with an awn at least 3 times its length* from below the apex; palea nearly as long as the lemma. Introduced from Eurasia. Nanaimo, V. I. (DA); Lumby (DA); near Nelson (DA).

A. pallens Trin. Culms erect *from creeping rhizomes,* 20-40 cm. tall; blades flat or somewhat involute, 1-4 mm. wide; ligule 2-3 mm. long; *panicle contracted, almost spike-like,* 5-10 cm. long; glumes 2.5-3 mm. long; lemma a little shorter than the glumes, *awnless*; *palea absent.* Sand dunes along the Coast, Wash. to Calif.; Lulu Is., Vancouver (PM).

A. Rossae Vasey. Garibaldi (DA); Kokanee, Nelson (DA); McBride (DA); Manning Park, Hope-Princeton (PM).

A. tenuis Sibth.

A. vulgaris With.

Culms slender, erect, tufted, usually 20-40 cm. tall, without rhizomes, but often with creeping stolons above ground; *ligule short, 1-2 mm. long;* blades mostly 5-10 cm. long, 1-3 mm. wide; panicle 5-10 cm. long, open, delicate, the slender branches naked below; spikelets not crowded; lemmas 1.5-2.5 mm. long, generally awnless; *palea about half as long as the lemma.* Introduced from Europe. Common around Vancouver and s.e. V.I. (M.O. Malte); Vancouver (DA); Hope (DA).

Forms of this species are cultivated as lawn grasses under the names of Rhode Island, Colonial, New Zealand, and Prince Edward Island Bents.

ALOPECURUS

A. myosuroides Huds.

A. agrestis L.

Perennial; culms tufted, slightly scabrous, 10-50 cm. tall, erect or decumbent at base; blades 2-3 mm. wide; panicle slender, *somewhat tapering at each end,* 4-10 cm. long, 3-5 mm. wide; *spikelets 5-6 mm. long;* glumes about 6 mm. long, pointed, glabrous, *scabrous on the keel;* lemma about as long as the glumes, awn bent, exserted 5-8 mm. Introduced from Europe. Saanichton, V.I. (DA).

A. carolinianus Walt. Annual; culms tufted, much branched at base, 10-50 cm. tall; similar to **A. geniculatus** but panicle more slender; spikelets 2.2-2.5 mm. long, awn exserted 2-3 mm.; anthers about 0.5 mm. long. Moist open ground, N. J. to B. C., s. to Fla. and Calif.

A. californicus Vasey= *A. Howellii* Vasey, according to Hitchcock's Manual, is an annual restricted to Ore. and Calif. only. The sp. given in Henry as *A. californicus* is probably **A. pallescens** Piper, which is frequent at the Coast. In Dr. Hitchcock's earlier treatment of this genus in Abrams Ill. F., *A. Howellii, A. californicus* and *A. pallescens* are all merged in *A. saccatus* Vasey, and opinions still differ as to which are good species.

AMMOPHILA

Spikelets 1-fld., compressed, rachilla disarticulating above the glumes, produced beyond the palea as a short bristle, hairy above; glumes about equal, chartaceous; lemma similar to and a little shorter than the glumes, the callus bearded; palea as long as the lemma.

A. arenaria (L.) Link. Culms 50-150 cm. tall, with deep, extensively creeping rhizomes; ligule thin, 10-30 mm. long, blades elongate, firm, soon involute, tapering to a fine point, upper surface pubescent; panicle 10-20 cm. long; spikelets 12-15 mm. long; glumes scabrous on the keel, the first 1-nerved, the second 3-nerved; lemma scabrous, the callus hairs about 3 mm. long. A valuable sand-binder of European coasts. Introduced for this purpose at Clayoquot, V. I.; apparently spontaneous and established on Sidney Island, Victoria (W. Newton, 1939 and 1946, DA).

ANDROPOGON

Spikelets in pairs at each node of an articulate rachis, one sessile and perfect, the other pedicellate and either staminate, neuter, or reduced to the pedicel, the rachis and the pedicels of the sterile spikelets often villous; glumes of the fertile spikelet coriaceous, narrow, awnless, the first rounded, flat, or concave on the back, several nerved, the median nerve weak or wanting; sterile lemma shorter than the glumes, empty, hyaline; fertile lemma hyaline, narrow, entire or bifid, usually bearing a bent and twisted awn from the apex or from between the lobes; palea hyaline, small, or wanting; pedicellate spikelet awnless, sometimes staminate and almost as large as the sessile one, sometimes only of one or more reduced glumes, or reduced to a pedicel.

A. scoparius Michx. Perennial; green, glaucous or purplish; culms tufted, compressed, 50-150 cm. tall, erect, the upper half freely branching; sheaths and blades commonly glabrous or nearly so, frequently sparsely pilose at their junction, rarely pubescent to villous throughout, blades 3-6 mm. wide, flat; raceme 3-6 cm. long, mostly curved, the filiform peduncle mostly wholly or partly included in the sheath, commonly spreading; rachis slender, flexuous, pilose, sometime copiously so; sessile spikelet 6-8 mm. long, scabrous, awn 8-15 mm. long; pedicellate spikelet reduced, short-awned, spreading, the pedicel pilose. Prairies, open woods, dry hills and fields, Que. to Alta. and s. to Fla. and Ariz. Dry hillside range, Fairmont Hot Springs (DA).

ANTHOXANTHUM

A. aristatum Boiss. Differs from **A. odoratum** in being annual, the culms lower, often geniculate and bushy-branched; panicles looser; spikelets a little smaller. Introduced from Europe. V. I. (Hitchcock); Barnston Is., New Westminster (DA).

ARISTIDA

A. longiseta Steud. var. **robusta** Merr. replaces *A. purpurea* Nutt., a southern sp. to which our plant was formerly referred.

BROMUS

B. maximus Desf.=**B. rigidus** Roth.

B. Hookerianus Thurb. is now usually included in **B. carinatus** H&A.

B. hordaceus L.=**B. mollis** L.

B. aleutensis Trin. Close to **B. sitchensis** Trin. but panicle branches shorter, stouter, and rather stiffly ascending, not drooping. Open ground, Aleutian Is. to Olympic region of Wash. Q.C.I. (PM. Cat.); Victoria (A. H. Brinkman); Vancouver (DA).

B. breviaristatus Buckl.

B. subvelutinus Shear.

Erect tufted perennial; culms 25-50 cm. tall; sheaths canescent to densely retrorse-pilose; *blades narrow, becoming involute, canescent,* and also pilose with spreading hairs, mostly erect or ascending, often only 1-2 mm. wide; *panicle narrow, erect,* 5-15 cm. long, *branches short, appressed,* often bearing only one spikelet; *spikelets strongly flattened (lemmas compressed-keeled),* 2-3 cm. long; lemmas appressed-puberulent; awn 3-10 mm. long. Dry wooded hills and meadows, Wyo. to e. Wash., Calif. and Ariz. Kelowna (A. H. Brinkman).

B. anomalus Rupr

B. Porteri Nash

Perennial, but *without rhizomes;* culms slender, 30-60 cm. tall, nodes pubescent; sheaths sparsely pilose to glabrous; ligule about 1 mm. long; blades scabrous, mostly 2-4 mm. wide; *panicle open, about 10 cm. long or less,* few-fld., drooping; first glume 3-nerved, second 5-nerved; lemmas about 12 mm. long, *not compressed-keeled, evenly and densely pubescent over the back;* awn 2-4 mm. long. Open woods and fields, Sask. and Ida. to Mex. Kamloops (E. W. T.); Canoe Ck. Crossing, Cariboo (DA); Hanceville, Chilcotin (DA); Francois Lake (DA).

B. japonicus Thunb. (JAPANESE CHESS)

B. patulus M&K

Annual; culms erect or geniculate at base, 40-70 cm. tall; sheaths and blades pilose; panicle 12-20 cm. long, broadly pyramidal, diffuse, somewhat drooping, the slender lower branches 3-5, *all the branches flexuous;* glumes rather broad, the first acute, 3-nerved, 4-6 mm. long, the second obtuse, 5-nerved, 6-8 mm. long; *lemmas broad, obtuse,* smooth, 7-9 mm. long, 9-

nerved, marginal pair faint; awn 8-10 mm. long, somewhat twisted and *strongly flexuous* at maturity; palea 1.5-2 mm. shorter than the lemma. Native of Eurasia and now widely distributed in N. Am. Apparently well established at Kamloops (DA); Kelowna (A. H. Brinkman).

B. squarrosus L. Very like the last, but spikelets broader (5 mm. or more broad when in flower); first glume obscurely 5-nerved, the second longer, 7-9-nerved; lemma 9-11 mm. long. Introduced from Europe. Kamloops (DA).

CALAMAGROSTIS

C. neglecta (Ehrh.) Gaertn. Not common; Riske Creek, Chilcotin (DA); Ootsa Lake (DA); Bella Coola (G. V. C.).

C. purpurascens R. Br. Frequent in Cariboo and northwards; not common, but widely distributed, further south.

C. rubescens Buckl. (including *C. Suksdorfii* Scribn.). Ainsworth, Longbeach and Kootenay Bay on Kootenay L.; Moyie; abundant at Cranbrook and lower Columbia Valley; Meldrum Creek, Chilcotin.

C. Scribneri Beal. Kootenay Nat. Park (DA).

C. montanensis Scribn. Culms stiffly erect, scabrous below the panicle, *20-30(-40) cm. tall, from slender creeping rhizomes;* lower sheaths rather papery, smooth; *blades erect, mostly less than 2 mm. wide, more or less involute,* scabrous, sharp-pointed; *panicle spike-like* and more or less interrupted, usually pale, 5-10 cm. long; spikelets 4-5 mm. long, pedicels very scabrous; glumes acuminate, scabrous; lemma nearly as long, 4-toothed, awn attached about 1 mm. above the base, about equalling the lemma, *slightly geniculate and protruding from the side of the glumes;* palea nearly as long as the lemma; hairs of callus and rachilla copious, about half as long as the lemma. Dry open ground, Man. to Alta., s. to S.D., Wyo., and Ida. Roadside, Invermere, Columbia Valley (DA).

CORYNEPHORUS

Much as in *Aira* but rachilla produced beyond the upper floret. Awn of lemma jointed about the middle, the joint with a ring of minute hairs, the lower segment brownish, the upper hyaline and club-shaped.

C. canescens (L.) Beauv. A tufted annual with stiff glaucous herbage; culms 20-40 cm. tall; panicle contracted, shining, pale or purplish. Adventive from Europe. Apparently well established on the site of Jericho Air Station, Vancouver; now probably a war casualty (DA).

DANTHONIA

D. intermedia Vasey. Widely distributed in the Province at medium altitudes. It forms the most conspicuous feature of the herbage over hundreds of acres on Lower Black Tusk Meadows, Garibaldi, alt. about 5000 ft. Descends to cultivated levels at Vanderhoof and Ootsa Lake (lat. 54).

D. unispicata Munro. Macdonald's Landing, Francois Lake (DA).

DESCHAMPSIA

D. calycina Presl=**D. danthonioides** (Trin) Munro; widely distributed; Smithers (DA) lat. 55; ranges n. to Alaska.

D. elongata (Hook.) Munro. Given in Henry only from Kootenay but common at the Coast; widely distributed.

D. flexuosa (L.) Trin. (Wavy Hair Grass). *Perennial;* culms densely tufted, erect, slender, 30-80 cm. tall; leaves mostly in a basal tuft; numerous, the sheaths scabrous, blades involute, slender or setaceous, flexuous; panicle loose, *open,* nodding, 5-12 cm. long, the capillary branches naked below, branches spikelet-bearing towards the ends; spikelets 4-5 mm. long, purplish

or bronze, the florets approximate; glumes 1-nerved, acute, *shorter than the florets;* lemmas scabrous, callus hairs about 1 mm. long; awn attached near the base, *exserted, geniculate, twisted,* 5-7 mm. long. Vacant lots and roadsides, West Point Grey, Vancouver (DA). Presumably introduced, but given as native from Alaska to Greenland and s. to N.C., Mich., and Wisc.; Eurasia.

D. holciformis Presl. *Perennial;* culms in dense tufts with numerous basal leaves, erect, relatively robust, 50-125 cm. tall; blades mostly folded, as much as 50 cm. long, 2-4 mm. wide; panicle 10-25 cm. long, *condensed, erect,* many-fld., the branches appressed to subflexuous ascending, purplish to brownish; spikelets 6-8 mm. long; glumes and lemmas scaberulous, the glumes equalling the spikelets or shorter, 3-nerved, the lateral ones of the first often obscure; lemmas awned from below the middle, *the awns straight,* slightly exceeding the spikelet, callus hairs short. Marshes and sandy soil near the coast, Alaska to Calif.

DIGITARIA

Annual or perennial. Inflorescence of 2 to several spike-like racemes from the summit of the culm. Spikelets lanceolate or elliptic, in twos or threes, rarely solitary, subsessile or short-pedicelled, alternate in 2 rows on one side of a 3-angled winged or wingless rachis; first glume minute or wanting; second glume equalling the sterile lemma or shorter; fertile lemma cartilaginous with pale hyaline margins.

D. sanguinalis (L.) Scop.

Syntherisma sanguinalis (L.) Dulac. (CRAB GRASS)

Annual, branched at base, culms often decumbent or creeping, 30-120 cm. long; *sheaths, at least the lower, papillose-hirsute;* blades flat, 5-12 cm. long, 4-10 mm. wide, often pubescent; racemes 3-12, slender, 5-12 cm. long; spikelets in twos, one subsessile, the other pedicelled, about 3 mm. long; first glume minute but evident; second about half as long as the spikelet, narrow, ciliate, sterile lemma strongly nerved; *fertile lemma pale.* Introduced from Europe. Occasional in cultivated land but nowhere abundant.

D. ischaemum (Schreb.) Muhl.

Syntherisma humifusum Rydb. (SMOOTH CRAB GRASS)

Resembling the last, but not so strong-growing; *foliage and sheaths glabrous,* more purple; *fertile lemma brown.* Introduced from Eurasia. Chilliwack (DA); Vernon (DA); Kamloops (E.W.T.). Both the above can be troublesome weeds, especially in lawns.

DISTICHLIS

D. spicata (L.) Greene. The form on the Pacific Coast has recently been distinguished from that on the Atlantic Coast as var. **borealis** (Presl) Beetle.

D. spicata var. **stricta** (Gray) Beetle

D. stricta (Torr.) Rydb.

This is distinguished from the Coast form by its looser panicles, with spikelets not usually closely imbricate; leaves usually shorter than the spikes; spikelets usually with more florets (5-20 as against 5-9). Common on alkaline soils in the Interior.

ELYMUS

E. borealis Scribn.=**E. hirsutus** Presl. Not common; head of Bute Inlet; Hope; Monashee Mts.; Edgewood, Arrow L.

E. dasystachya Trin. is an Asiatic sp. not known to occur in N. Am. Specimens from B. C. so named are probably **E. innovatus** Beal.

E. innovatus Beal; Fairmont Hot Springs (DA); Field (DA); Kootenay Nat. Park (DA); Vanderhoof (DA).

E. macounii Vasey. Not common; 141 Mile, Cariboo Road (DA); Anahim Lake, Chilcotin (DA); Lavington (PM); Douglas Lake (G.V.C.).

E. virescens Piper. *Perennial;* tufted, *without rhizomes,* often forming large clumps; culms 30-120 cm. tall, often decumbent at base; sheaths glabrous to retrorse-pubescent; blades 2-12 mm. wide; spike 5-15 cm. long, dense, spikelets imbricate; *glumes broadest above the base,* flat, 1-2 mm. wide, *strongly nerved,* pointed or awn-tipped; lemmas glabrous to scabrous, *awn-pointed or with an awn only 1-4 mm. long.* Calif. to s. Alaska. Clay cliffs by sea, Beacon Hill Park, Victoria (DA).

FESTUCA

F. bromoides=**F. dertonensis** (All.) Aschers. & Graebn. Given only from V.I. but frequent on the Mainland; Vancouver; Gibson's Landing; Ladner; Boundary Bay; Penticton.

F. ovina var. *ingrata* Hack.=**F. idahoensis** Elmer. Apparently rare; Mayne Is. (Can.).

F. scabrella Torr.

F. Hallii (Vasey) Piper. (ROUGH FESCUE)

Given in Henry only from Crow's Nest Pass; Tranquille (DA); Penticton (DA); near Sinclair Canyon (DA).

F. subulata Trin. Frequent in the Vancouver area; Popcum (DA).

F. subuliflora Scrib. Rare on the Mainland; Spanish Banks, Vancouver (DA). The former has the upper surface of leaf merely scabrous; in the latter it is pubescent.

F. capillata Lam. (HAIR FESCUE). Densely tufted; somewhat resembling **F. ovina** but lower and more slender; blades capillary, flexuous, usually more than half as long as the culm; spikelets smaller, lemma about 3 mm. long, awnless. European. Vancouver (DA), probably introduced with lawn-grass seed.

F. viridula Vasey. *Perennial;* culms rather loosely tufted, *erect,* 50-100 cm. tall; blades soft, erect, those of culm flat or loosely involute, *of innovations, involute, slender;* panicle open, 10-15 cm. long, branches mostly in pairs, ascending or spreading, slender, somewhat remote, naked below; spikelets 3-6-fld.; glumes lanceolate, somewhat unequal, 5-7 mm. long; lemmas membranous, acute or cuspidate, *awnless or nearly so,* glabrous, 6-8 mm. long. Mt. meadows and open slopes at 1000-2000 m., B. C. and Alta. s. to Ida. and Calif. Mt. Kokanee and Toad Mt., Nelson (DA), both at about 6000 ft.; Hope Mt. (G.V.C.); Manning Park, Hope-Princeton (PM).

FLUMINEA

Spikelets 3-4-fld.; glumes nearly equal, somewhat scarious and lacerate at apex, the first 3-nerved, second 5-nerved, about as long as the first lemma; lemmas firm, rounded on the back, villous on the callus, 7-nerved; nerves rather faint; palea narrow, flat, about as long as the lemma. Tall perennials with strong rhizomes, flat blades and spreading panicles.

F. festucacea (Willd.) Hitchc.

Scolochloa festucacea (Willd.) Link.

Culms erect, stout, 100-150 cm. tall; blades elongate, scabrous on the upper surface, mostly 5-10 mm. wide; panicle 15-20 cm. long, loose, branches distant, fascicled, ascending, naked below, the lowermost nearly as long as the panicle; spikelets about 8 mm. long, florets approximate; lemmas about 6 mm. long. Shallow water and marshes, Man. to B. C. s. to Ida., Neb., and e. Ore. Not common; McQueen L., Tranquille (DA); Lac la Hache (PM); Mammette L., Nicola (G.V.C.); Dog Creek, Cariboo (DA); Nulki L., Vanderhoof (PM).

GLYCERIA

G. nervata Trin.=**G. striata** (Lam.) Hitchc.
var. *elata* (Nash) Piper=**G. elata** (Nash) Hitchc.

G. septentrionalis Hitchc. is an eastern sp. Its western representative is **G. occidentalis** (Piper) J. C. Nels. Not common; Chilliwack (DA).

G. leptostachya Buckl. Culms 1-1.5 m. tall; sheaths slightly rough; blades flat, scaberulous on upper surface, 4-7 (-10) mm. wide; panicle 20-40 cm. long, branches ascending, mostly in 2's or 3's, several-fld., often with secondary branchlets; spikelets 1-2 cm. long, 8-14-fld., often purplish; glumes 1.5-3 mm. long; lemmas firm, broadly rounded at apex, *about 3 mm. long,* 7-nerved, *scaberulous on the nerves and between them.* Wrangell, Alaska to cent. Calif. (Anderson). Alberni, V.I., J. K. Henry (PM. Cat.).

G. pulchella (Nash) K. Schum. Differs from **G. grandis** in being only 40-60 cm. high; leaves 2.5-6 mm. wide; glumes obtuse; lemmas with broad scarious margins. Alaska-Mack.-Alta.-B. C. (Anderson). Probably n. B. C. only.

HIEROCHLOE

H. odorata (L) Beauv. is widely distributed but rarely abundant.

H. alpina (Swartz) Roem. Differs from the above in being lower (10-40 cm.); leaves only 1-2 mm. wide; panicle contracted, 3-4 cm. long; staminate lemmas awned. Alaska to Greenld. s to Que. and New Eng.; Europe. Sparingly on an exposed ridge at 6000 ft., McBride, lat. 53 (DA).

HOLCUS

H. mollis L. Distinguished from the common **H. lanatus** by the presence of rhizomes; sheaths glabrous or nearly so; awn of upper (staminate) lemma exserted, geniculate, instead of short and hook-like. Introduced from Europe. Langley Prairie, H. Groh (DB).

HORDEUM

H. Gussoneanum Parl. (Mediterranean Barley). *Annual;* culms freely branching and spreading or geniculate at base, 15-40 cm. tall; sheaths and flat blades, especially the lower, more or less pubescent; spike erect, 1.5-3 cm. long, 1-1.5 wide, *with rigid awns; rachis disarticulating;* glumes setaceous, *not ciliate,* nearly glabrous to scabrous, about 12 mm. long; lemma of central spikelet 5 mm. long, the awn somewhat longer than the glumes; floret of lateral spikelets short-awned. Introduced from Europe. Common around Victoria.

LEERSIA

L. oryzoides (L) Swartz. Still Creek and Burnaby Lake (DA); Sumas Prairie (DA); Rosedale (R. Glendenning); Kamloops (E.W.T.).

MELICA

For *M. striata* see Schizachne

M. Smithii (Porter) Vasey. Alberni, V.I. (U); abundant in woods at Bridal Veil Falls, Popcum (DA) and at Six Mile Lakes, Nelson, at about 4000 ft. (DA).

M. subulata (Griseb.) Scribn. Occurs also in the Interior; Tenquille L., Pemberton (DA); Rossland (DA); Ootsa Lake (DA).

MUHLENBERGIA

M. asperifolia (Nees & Mey.) Parodi
Sporobolus asperifolius Nees & Mey. Athalmer, Columbia Valley (DA).

M. cuspidata (Torr.) Rydb.
Sporobolus brevifolius (Nutt.)

M. racemosa (Michx.) BSP. Flood plain of Columbia R. w. of Donald (DA); swamp near Kinbasket, Big Bend Highway (DA).

M. squarrosa (Trin.) Rydb.

Sporobolus Richardsonis (Trin.) Merr. All specimens in DA are from Cariboo and Chilcotin.

M. filiformis (Thurb.) Rydb. *Annual;* tufted, rather soft and lax, erect or somewhat spreading; culms filiform, usually 5-15 cm. tall, sometimes 30 cm.; ligule about 2 mm. long, blades flat, usually less than 3 cm. long; *panicle narrow, spike-like,* interrupted, few-fld., usually less than 5 cm. long; glumes ovate, *glabrous,* 1 mm. long; lemma lanceolate, acute, mucronate, *2 mm. long,* minutely pubescent, scaberulous at the tip.

Open woods and mt. meadows, S.D. and Kan. to B. C. and s. to N. Mex. and Calif.

M. sylvatica Torr.

M. umbrosa Scribn.

Perennial with creeping scaly rhizomes; culms rather slender, *branched,* 5-10 dm. high, retrorsely scaberulous below the nodes; *blades flat; panicle narrow,* nodding, the branches distant, appressed; glumes lanceolate, rather abruptly acuminate or awn-pointed, about 2mm. long; lemma a little longer, somewhat pilose below, tapering into an awn 5-10 mm. long, but occasionally reduced or absent. Maine to S.D. s. to Tex., Ala., and Ariz. Roadside, Griffin Lake (DA), probably introduced.

ORYZOPSIS

O. asperifolia Michx. Armstrong; Kamloops; Crawford Bay, Kootenay Lake; common northwards.

O. pungens (Torr.) Hitchc. Frequent northwards; Quesnel; Francois Lake; Topley; Hazelton; all in DA.

O. exigua Thurb. Culms densely tufted, stiffly erect, scabrous, 15-30 cm. tall; sheaths smooth or somewhat scabrous; ligule 2-3 mm. long; blades involute-filiform, stiffly erect, scabrous, 5-10 cm. long, the culm blades about 2, shorter; *panicle narrow,* 3-6 cm. long, *the branches appressed,* the lower 1-2 cm. long; spikelets short-pedicelled, glumes abruptly acute, *4 mm. long; lemma appressed-pilose,* about as long as the glumes, awn about 5 mm. long, geniculate, not twisted. Dry open ground or open woods at moderate altitudes, Mont. to Wash. s. to Colo., Ore., and Nev. Kingsvale, Merritt, G. V. Copley (PM; G.V.C.).

O. micrantha (Trin. & Rupr.) Thurb. Culms densely tufted, erect, slender, 30-70 cm. tall; ligule 1 mm. long; blades slender, scabrous, flat or involute; *0.5-2 mm. wide; panicle open,* 10-15 cm. long, the branches distant, single or in pairs, *spreading or finally reflexed,* 2-5 cm. long, with short-pedicelled, appressed spikelets towards the ends; glumes thin, acuminate, 3-4 mm. long; lemma elliptic, *glabrous,* 2-2.5 mm. long, yellow or brown, the straight awn 5-10 mm. long. Open dry woods and rocky slopes, Sask. to Mont. s. to N. Mex. and Ariz. Pavilion L., Cariboo, E. W. Tisdale (DA).

PANICUM

P. occidentale Scribn. Sproat Falls, Elk Falls Park, and Great Central L. on V.I.; Nakusp; Gray Creek and Destiny Bay on Kootenay Lake.

P. Scribnerianum Nash. Armstrong (U); dry rocky ground, Poplar Grove, Penticton (DA).

P. pacificum Hitchc. & Chase. Very close to **P. occidentale** from which it differs by more copious pubescence throughout; vernal shoots with upper surface of leaves pilose (glabrous or nearly so in **occidentale**), more leafy culms, and autumnal culms prostrate and branching repeatedly from the middle and upper nodes. B. C. to Ida., s. to Ariz. and Calif. Shawnigan L., V.I. (DA); Agassiz (DA); lake shore, Osoyoos (DA).

P. thermale Boland. Much like the last but grayish-green and velvety-villous; autumnal culms widely spreading, repeatedly branching, the whole forming a dense cushion. Wet saline soil in the immediate vicinity of geysers and hot springs, Alta. to Wash., s. to Wyo. and Calif. Around the basins and along runnels of the hot springs at Fairmont, Columbia Valley (DA).

P. capillare var. **occidentale** Rydb.

P. barbipulvinatum Nash

Differs from the sp. in having blades shorter, less pubescent, crowded towards the base; panicle more exserted; spikelets somewhat longer (2.5-3.5 mm.). The common form in B. C.

PLEUROPOGON

P. refractus (A. Gray) Benth. Munro L., Coquitlam, at ca. 3500 ft., P. P. Henson (DA); stream at ca. 2000 ft., Hollyburn Ridge, W. Vancouver (DA).

POA

P. Buckleyana Nash=**P. scabrella** (Thurb.) Benth. Occurrence in B. C. doubtful.

P. cenisia=**P. arctica** R. Br. as to our area.

P. Fendleriana (Steud.) Vasey; Tranquille (DA); Mt. Apex, Penticton (DA).

P. glauca Vahl, as now understood, is an eastern and arctic sp. The one under this name in Henry is **P. secunda** Presl. (The name **P. Sandbergii** is preferred by some authorities). This is one of the commonest range grasses of the Interior, flowering early, May-June.

P. gracillima Vasey. Garibaldi; Yale; Antimony Mt., Lytton; Kokanee, Nelson; Manning Park; Paradise Mine, Windermere; mostly at 4000 ft. or more.

P. Lettermani Vasey. Antimony Mt., Lytton; Mt. Dunn, Chu-chua; both collected by E. W. Tisdale at 7500-8000 ft. (DA).

P. subpurpurea Rydb.=**P. epilis** Scribn. Mt. Arrowsmith, V.I. (PM); Garibaldi (DA); Manning Park (PM); Mt. Apex and Mt. Brent, Penticton (DA); McBride (DA).

P. triflora Gilib.=**P. palustris** L.

Additional Species

P. bulbosa L. Tufted perennial *without rhizomes; culms bulbous at base,* 30-60 cm. tall; blades flat or loosely involute, 1-2 mm. wide; *panicle narrowly ovoid, dense,* 3-10 cm. long, *the florets usually changed into bulblets* with a dark purple base and slender green tips 5-15 mm. long; unaltered spikelets about 5-fld.; lemmas 2-5 mm. long, *webbed at base,* densely silky on keel and marginal nerves, intermediate nerves faint. Introduced from Europe; established in Beacon Hill Park, Victoria since 1921 (PM); Kamloops (DA); Armstrong (DA).

P. Canbyi (Scribn.) Piper

P. lucida Vasey

Perennial, tufted, *without rhizomes,* green or glaucous; *culms slender, 50-120 cm. tall;* ligule 2-5 mm. long; blades flat or folded; *panicle narrow,* compact or rather loose, 10-15 (-20) cm. long, *branches short, appressed; spikelets little compressed, much longer than wide, keels obscure,* 3-5-fld.; lemmas more or less crisp-pubescent on lower part of back, *not webbed.* Minn. to Yukon, s. to Neb., Colo., and e. Wash. Mt. Tolmie, Victoria (DA); Field (Ulke); Quesnel Dam (PM).

P. Cusickii Vasey. Densely tufted perennial *without rhizomes;* green or glaucous; culms erect, 20-60 cm. tall; ligule very short; *blades filiform,* erect, *scabrous,* mostly basal; panicle usually pale or tawny, *narrow,* oblong,

contracted, or somewhat open at anthesis, 3-8 cm. long; spikelets 7-9 mm. long; *lemmas not webbed, glabrous,* 4-6 mm. long, smooth or scabrous. Dry or rocky slopes at medium to high alt., Alta. and B. C. s. to Colo. and Calif. Clinton (E.W.T.).

P. glaucifolia Scribn. & Will. Perennial *with creeping rhizomes;* glaucous; culms in loose tufts, 60-00 cm. tall; blades 2-3 mm. wide; panicle narrow, open, *mostly 10-20 cm. long,* the branches usually in rather distant whorls, *mostly in threes,* ascending, very scabrous, naked below; spikelets 2-4-fld.; glumes 4-5 mm. long; lemmas about 4 mm. long, *not webbed, but villous on the lower half of keel and marginal nerves and more or less so on the intermediate nerves below.* Moist places and open woods at medium alt., B. C. and Alta. through Mont. to N. Mex., Ariz., and Nev.

P. interior Rydb. Close to **P. palustris,** from which it differs in the culms being erect, not decumbent at base; ligule usually less than 1 mm. long; panicle mostly less than 10 cm. long and comparatively few-fld. Grassy slopes and open woods at medium alt., Que. to B. C. and Wash., s. to Vt. and Ariz. Widely distributed e. of the Cascades, n. to lat. 54.

P. juncifolia Scribn. Much like **P. ampla** but forming smaller clumps, usually strongly glaucous, and the leaves involute and rather stiff; spikelets 3-6-fld., 7-10 mm. long; lemmas about 4mm. long. Alkaline meadows and open dry woods, Mont. to B. C., s. to Colo. and Calif. Monte Creek; Nicola; Merritt; Williams Lake; Chezacut (Chilcotin).

P. lanata Scribn. & Merr. Perennial *with creeping rhizomes; culms erect, 25-40 cm. tall,* usually with only one leaf; leaves glaucous, rather rigid, 2-4 mm. wide, acute and hooded at the apex; panicle open, 5-12 cm. long, the branches mostly in twos; spikelets ovate, acute, purplish or brownish, *compressed, 8-10 mm. long,* 3-6-fld.; glumes acute, 3-nerved, scabrous on the keel; *lemmas 6-7 mm. long,* with broad hyaline margins, 5-nerved, obtuse, *densely webbed* on lower half, strigose above. Differs from **P. arctica** in the taller culms, leaf characters, larger spikelets, larger and more densely pubescent lemmas. Aleutian Is. to Athabaska Lake and B. C. (Anderson). Possibly only in northern B. C.

P. laxiflora Buckl. *With creeping rhizomes;* culms 100-120 cm. tall, *retrorsely scabrous,* the sheaths slightly so; ligule 3-5 mm. long; blades lax, 2-4 mm. wide; panicle loose, open, nodding or drooping, 10-15 cm. long, the lower branches in whorls of 3-4; spikelets 5-6 mm. long, 3-4-fld.; lemma about 4 mm. long, *webbed at base and sparsely pubescent on lower part of nerves.* A rare grass, known from Alaska, Wash. and Ore. and therefore to be expected to occur in B. C.

P. marcida Hitchc. Perennial *without rhizomes;* culms erect in small tufts, 40-100 cm. tall; *sheaths glabrous; ligule very short;* blades thin, 1-3 mm. wide; *panicle narrow, drooping,* 10-18 cm. long, the capillary branches somewhat distant, *solitary or in pairs,* ascending or appressed; spikelets mostly 2-fld.; glumes about 3 mm. long; lemmas narrowly lanceolate, acuminate, 4-5 mm. long, *webbed at base, otherwise glabrous.* Bogs and wet shady places, V.I. to coast mts. of Ore., Stanley Park, Vancouver (DA).

P. paucispicula Scribn. & Merr. Perhaps not specifically distinct from **P. leptocoma** from which it differs in forming larger tufts; smooth sheaths; broader spikelets; florets close, concealing the rachis. Mts. Alaska to Wash.; Montana. Black Tusk screes, Garibaldi (DA); betw. Ootsa and Francois L. (DA); McBride at 6000 ft. (DA).

P. reflexa Vasey & Scribn. Perennial *without rhizomes;* culms solitary or in small tufts, erect, 20-40 cm. tall; blades rather short, 1-4 cm. wide; *panicle nodding,* 5-15 cm. long, the branches naked below, solitary, in pairs, or in threes, *the lower usually reflexed,* sometimes strongly so; spikelets 2-4-fld.; lemmas about 3 mm. long, oblong-elliptic, *webbed at base, villous*

on keel and marginal nerves. Open slopes and alpine meadows at 6000-12,000, Mont. to e. B. C. and s. in the mts. to N.M. and Ariz. Glacier (PM).

P. rupicola Nash. Perennial *without rhizomes;* culms densely tufted, erect, rather stiff, often scaberulous below panicle, 10-20 cm. tall, *much longer than the basal leaves;* blades short, rather lax, usually flat, *1-1.5 mm. wide; panicle narrow,* purplish, 2-4 cm. long, *the short branches ascending or appressed;* spikelets usually purple, about 3-fld.; *lemmas not webbed, villous below on keel and marginal nerves* and sometimes on the inter-nerves. Mts. at high alt., B. C. and Mont. to Ore. and Calf. Mt. Waddington (PM); Paradise Mine, Windermere (PM).

P. stenantha Trin. Perennial *without rhizomes;* culms tufted, 30-50 cm. tall; ligule as much as 5 mm. long; blades flat or loosely involute; *rather lax,* mostly basal, 1-2 mm. wide, the uppermost culm-leaf below middle of culm; *panicle longer than broad, nodding,* 5-15 cm. long, the branching in twos or threes, *arcuate-drooping,* naked below, with a few spikelets at the ends; spikelets 3-5-fld., 6-8 mm. long; lemmas about 5 mm. long, *not webbed, but pubescent on the lower part of keel and marginal nerves,* sparsely pubescent on inter-nerves below. Moist open ground, Alaska, B. C. and Alta. to Mont., Colo., Ida., Wash. and Ore. Shore of Garibaldi L. (DA); New Denver (PM); Lingfield Creek, Chilco (DA); Manning Park (PM); Hudson Bay Mt., Smithers (DA).

POLYPOGON

P. monspeliensis (L.) Desf. Frequent in the Interior, around sloughs, especially if alkali present; S. Okanagan; Columbia Valley; Chilcotin.

PUCCINELLIA

P. angustata (R. Br.) Nash=**P. pumila** (Vasey) Hitchc.

P. grandis Swallen. Culms 50-90 cm. tall, erect or geniculate at the lower nodes; leaf-blades 0.5-3 mm. wide, flat or involute on drying; panicle 10-20 cm. long, the branches at first appressed but later spreading, scabrous; spikelets appressed, purplish, 8-15 mm. long, 5-12-fld.; first glume 2-3 mm. long, obtuse or subacute; second 3-3.5 mm. obtuse; lemmas 3-4 mm. long, sparsely pilose at base; anthers mostly 1.3-1.5 mm. long. Salt marshes and sea-shores from Alaska to Calif. Records from B. C. include Cadboro Bay, Victoria; Crescent, near Vancouver. A recently published species (1944).

P. nutkaensis (Presl) Fern. & Weath. Culms 20-60 cm. tall, usually erect; leaf-blades 1-2 mm. wide, flat or subinvolute; panicle narrow, 5-20 cm. long, the few, slender branches appressed, smooth or nearly so; spikelets 6-9 mm. long, 4-9-fld.; glumes about 1.5 and 2.5 mm. long; lemmas about 3 mm. long, narrowed to an obtuse, erose, or minutely fimbriate apex; anthers 0.8-1 mm. long. Wet saline soil near the coast, Alaska to Calif. Type collected at Nootka by Haenke; Saanich Spit; Nanaimo; West Vancouver.

P. Nuttalliana (Schult.) Hitchc. Culms mostly 30-60 cm. tall; basal leaves inconspicuous; blades 1-3 mm. wide, flat or becoming involute; panicle pyramidal, open, mostly 10-20 cm. long, branches ascending to spreading, rarely reflexed, up to 10 cm. long; spikelets 3-6-fld., 4-7 mm. long; glumes about 1.5 and 2 mm. long; lemmas 2-3 mm. long, rather narrow, somewhat narrowed into an obtuse apex; anthers about 0.7 mm. long. Moist alkaline soil, Minn. to B. C. s. to N. Mex. and Calif. Widely distributed in the Interior, but rarely abundant; McBride, lat. 53 (DA).

SCHIZACHNE

Spikelets several-flowered, disarticulating above the glumes and between the florets, the rachilla glabrous; glumes unequal, 3- and 5-nerved; lemmas lanceolate, strongly 7-nerved, long-pilose on the callus, awned from just

below the teeth of the prominently bifid apex; palea with softly pubescent, thickened submarginal keels, the hairs longer towards the summit. Rather tall perennial with simple culms and open rather few-fld. panicles.

S. striata (Michx.) Hult.

S. purpurascens (Torr.) Swallen

Melica striata (Michx.) Hitchc. in Henry

Alaska and B. C. to Newf. s. to Mont., N. Mex., S.D., Ky., and Pa. Field (DA); common northwards, Quesnel; Prince George; Fort St. James.

SETARIA

S. viridis (L.) Beauv. has become a widely distributed weed, especially in the Okanagan.

S. lutescens (Weig.) Hubb.

S. glauca (L.) Beauv. in Henry

This is still a rather uncommon plant; Stapleby, V.I. (U); Duncan, V.I. (DA); Coquitlam (DA); Agassiz (DA); Osoyoos (DA).

SITANION

Much as in *Elymus* but the mature spike breaking up into segments, each with a pair of spikelets at the upper end. Glumes narrow or setaceous, 1-3-nerved, the nerves extending into 1-several awns, these often very unequal. Lemmas firm, convex on back, 1-3-awned from the apex; palea firm, 2-keeled, nearly equalling the lemma.

S. hystrix (Nutt.) J. G. Smith. Culms erect to spreading, rather stiff, 10-50 cm. tall; leaves glabrous to white-pubescent, blades flat to involute, 5-20 cm. long, 1-3 (-5) mm. wide; spike, including awns, as broad as long, partly included, erect, 2-10 cm. long; glumes 1-nerved and simple, or bifid, very narrow; lemmas convex, smooth or scabrous to appressed-pubescent; awns of glumes and lemmas widely spreading, 2-10 cm. long. Dry hills and plains, S.D. to B.C. and s. to Mex. Tranquille (DA); Redstone, Chilcotin (DA); Manning Park (PM); Canal Flats (DA); Paradise Mine, Windermere, at about 8500 ft. (PM).

SPARTINA

S. cynosuroides (L.) Roth. is an Atlantic Coast sp. formerly confused with **S. pectinata** Link (*S. Michauxiana* Hitchc.). This latter is a much coarser plant than our common **S. gracilis;** 1-2 m. tall, spikes usually 10-20, 5-12 cm. long, not closely appressed; second glume with an awn as much as 7 mm. long. Newf. to e. Wash. and south. The only recorded B.C. specimen was collected on the shore of Sea Island at the mouth of the Fraser R. (V. C. Brink). The seed may have been brought down from the Interior by the river.

SPHENOPHOLIS

S. obtusata (Michx.) Scribn. Uncommon; Tranquille (DA); Gray Ck., Kootenay L. (DA); Fairmont, Columbia Valley (DA).

S. pallens (Spreng.) Scribn. according to Hitchcock is a sp. of which only a few specimens are known. The one under this name is **S. intermedia** Rydb. (*S. pallens major* Scribn.).

SPOROBOLUS

S. cryptandrus (Torr.) Gray is quite widely distributed in the southern Dry Belt, extending at least as far north as Redstone, Chilcotin (DA). For other sp. see Muhlenbergia.

STIPA

S. Elmeri Piper & Brodie. Culms 60-100 cm. tall, more or less puberulent especially at the nodes; *sheaths pubescent;* ligule very short; blades 15-30 cm. long, 2-4 mm. wide, flat or becoming involute, pubescent on the upper surface, and those of the innovations also on the lower; panicle narrow, 15-35 cm. long, rather loose; glumes 12-14 mm. long, long-acuminate, hyaline except at base; *lemma about 7 mm. long,* appressed-pubescent, callus 1 mm. long; awn 4-5 cm. long, distinctly twice-geniculate, the segments nearly equal, *the first and second plumose.* Dry hills, plains and open woods, Wash. and Ida. to Calif. Midway (DA).

S. Lemmoni (Vasey) Scribn. Culms 30-80 cm. tall, scaberulous, usually puberulent below the nodes; ligule 1-3 mm. long; blades 10-20 cm. long, flat or involute, 1-2 mm. wide or those of the innovations very narrow; panicle 5-12 cm. long, *narrow,* pale or purplish; glumes 8-10 mm. long, *rather broad and firm,* abruptly acuminate, *the first 5-, the second 3-nerved; lemma 6-7 mm. long,* pale or light brown, callus rather blunt, sparsely appressed-villous; awn 2-3.5 cm. long, twice-geniculate, appressed-pubescent to the second bend, *but not plumose.* Dry open ground and open woods, B.C. to Ida. and Calif. Comox Spit, V.I. (PM).

S. occidentalis Thurb. Culms 25-40 cm. tall; *sheaths glabrous; ligule about 0.5 mm. long;* blades 10-20 cm. long, 1-2 mm. wide, flat or usually involute, glabrous beneath; panicle 10-20 cm. long, lax, the few slender branches narrowly ascending; glumes narrow, about 12 mm. long, the attentuate tips hyaline; lemma pale brown, about 7 mm. long, rather sparsely appressed-pubescent; awn 3-4 cm. long, *twice-geniculate, the first and second segments plumose,* the hairs about 1 mm. long. Plains, rocky hills and open woods, Wyo. to Wash. and Calif. Merritt (PM); Manning Park (PM).

S. Williamsii Scribn. Differs from **S. columbiana** chiefly in the more pubescent culms, sheaths and blades; culms 60-100 cm. tall; panicle 10-20 cm. long; lemma about 7 mm. long, awn 3-5 cm. Dry hills and plains, Mont. to Wash. s. to Colo. and Calif. Open dry woods, Monte Creek (DA); Lac la Hache (PM).

S. columbiana Macoun and **S. Richardsoni** Link are both widely distributed in the Interior. The former ranges north to the Yukon, the latter at least to lat. 54 (Francois Lake, DA).

S. spartea Trin. All specimens in DA are var. **curtiseta** Hitchc. with glumes only 2-3 cm. long; lemmas 12-15 mm. long; awn mostly not more than 7 or 8 cm. long. Not common; Lac la Hache (PM); Chilcotin (DA).

TRISETUM

All three species given in Henry are widely distributed, both at the Coast and in the Interior.

T. spicatum (L) Richt., alpine or subalpine in the south, descends to cultivated levels in lat. 54. var. **molle** (Michx.) Beal, with foliage densely pubescent, is much less common than the type.

T. flavescens (L) Beauv. (YELLOW OAT-GRASS). Resembling **T. canescens;** sheaths glabrous or the lower sparsely pilose; panicle usually yellowish, many-flowered, somewhat condensed; spikelets mostly 3- or 4-fld; lemmas 4-6 mm. long. Introduced from Europe as a forage plant and occasionally escaping.

CYPERACEAE
CAREX

This difficult genus needs a more complete revision than is possible within the limits of this supplement. The following corrections, changes of name, and ranges of species, other than local ones, are based on K. K. Mackenzie's

monograph in the North American Flora. References to this are indicated by M. Owing to the unfortunate destruction of Dr. Henry's herbarium after his death, it is not possible to determine what species, according to later interpretations, formed the basis of some of these records. Some, also, are cited from Macoun's Catalogue of Canadian Plants (1883-1890) with the nomenclature of that day. Of these, some have been traced, and the nomenclature brought up to date where necessary.

Changes of Name, Corrections, and Extensions of Range

Numbers those of Henry's Flora.

3. *C. nardina* Fries, according to M is an eastern and arctic sp. In recent years the name **C. Hepburnii** Boott has been generally used for the form occurring in Alta., B.C. and Wash., but the validity of the separation appears to be again in question. *C. nardina* var. *Hepburnii* (Boott) Kukenth. is also used. Mt. McLean, Lillooet (DA); Paradise Mine, Windermere, at 8000 ft. (PM).

4. **C. sychnocephala** Carey. Uncommon; near Vanderhoof (U).

5. *C. festiva*=**C. festivella** Mack., much less common than the next. **C. pachystachya** Cham. is regarded as distinct, differing in the perigynia being more spreading in the spikes, thicker, plano-convex, with a thicker, firmer wall. One of the commonest sp. in the province. *C. ebenea* Rydb. is not known to occur in our limits. **C. Haydeniana** Olney. See section Ovales.

7. *C. cristata* Schw., now reduced to synonomy, has been applied to several sp. Its application here is uncertain.

9. *C. Liddoni* Boott is not considered distinct from **C. petasata** Dewey.

11. *C. hormathodes* Fern, as now understood, is a sp. of the Atlantic Coast.

12. *C. straminea* Willd. is an eastern sp.; var. *mixta* Bail=**C. feta** Bail., distinguished by the additional character of the sheaths being green-striate ventrally and hyaline only at the mouth. Alberni, V.I.; Sardis; Cultus Lake; Nelson. **C. tenera** Dewey is regarded as distinct; Maine to Wash. and s., so may occur in B.C.; see section Ovales.

15. *C. pratensis* Drejer=**C. praticola** Rybd. Vancouver (DA); Nelson (DA); frequent in Central B.C. var. *furva* Bail.=**C. Piperi** Mack. Type from V.I.; Nelson (DA).

16. **C. aenea** Fern. Alberni, V.I. (PM); Emerald L., Yoho (DA); frequent in lat. 53-54.

17. **C. adusta** Boott. Introduced in B.C. (M).

18. *C. foenea* Willd. The w. limit of this sp. as given in M. is Mich. & O. The record is from Macoun Cat. part V (1890). Rydberg, F. Rocky Mts. says under **C. aenea** ' "*C. foenea* Willd." of our range'.

19. *C. Leersii* Willd.=*C. muricata* L. not known from B.C. var. *cephalantha* Henry, not Fern.=**C. cephalantha** (Bail.) Bickn.

20. *C. scirpoides* Schk.=**C. interior** Bailey. Common.

21. *C. tenuirostris* Olney; not distinct from **C. athrostachya** Olney.

24a. *C. canescens* var.=**C. arctaeformis** Mack. In addition to having the spikes clustered in a head, the perigynia are largely concealed by the scales. Type collected by J. K. Henry at Elgin; other records Lulu Is., Cloverdale, and Langford L., V.I. in B.C. and Sitka, Alaska. Locally plentiful on Lulu Is., Vancouver (DA).

27. **C. laeviculmis** Meinsh. Widely distributed; Vancouver; Sicamous; Nelson; Boat Encampment, Big Bend Highway.

29. **C. Lachenalii** Schk. Recorded from Alta., Mont., and Yukon, so may occur in B.C. Anderson keeps this name; syn. of *C. bipartita* All. in M.

32. *C. densa* Bailey is given in M. only from Calif. and Ore.

36. *C. Gayana* Desf.=*C. simulata* Mack., known from Mont., Ida., and Wash.

37. *C. tenella* Schk.=**C. disperma** Dewey, widely distributed in B.C.

40. *C. diandra* Schrank var. *ampla* Bailey=**C. Cusickii** Mack. Occurs in the Interior as well as the Coast; Nelson (DA); Boswell (DA).

41. *C. camporum* Mack.=**C. praegracilis** W. Boott. Widely distributed in the Interior; Ashcroft; Penticton; Windermere; Field; Chilcotin; ranging north into Yukon.

42. *C. alma* Bailey given in M. only from Calif., Nev., and Ariz.

43. **C. siccata** Dewey. Not credited to B.C. in M. but collected at Vanderhoof (DA). This sp. has apparently been much confused with **C. praegracilis** W. Boott, which has stout, blackish rhizomes, while the former has slender brown ones.

44. *C. sitchensis* as here described is **C. obnupta** Bailey, a very common sp. at the Coast. The two sp. were for long confused.

45. *C. Barbarae* Dewey is confined to Calif. and s. Ore. The one described under this name is **C. sitchensis** Prescott. Occurs also in the Interior; Blackwater L., Big Bend Highway (DA); McBride (DA).

47. *C. cryptocarpa* Mey.=**C. Lyngbyei** Hornem. See also no. 107.

49. **C. bicolor** All. is an arctic sp. which may occur in northern B.C. The name has also been applied to **C. Garberi** and **C. Hassei,** q.v.

51. *C. rigida* Good.=**C. concolor** R. Br. Cowichan R., V.I. (G.V.C.).

52. *C. nudata* var. *angustifolia* Bail. Evidently cited from Macoun Cat. V: 379 and probably **C. concolor** R. Br. *C. nudata* W. Boott, according to M. is confined to Ore. and Calif.

53. *C. invisa* Bailey=**C. spectabilis** Dewey, widely distributed at medium to high alt., both at the Coast and in the Interior.

54. **C. aperta** Boott. Widely distributed; Mirror L., Kaslo; Creston; Prince George; Vanderhoof; Ootsa Lake.

55. *C. acutina* Bail. Application uncertain. In M. this name is a syn. of *C. nudata* W. Boott. (See no. 52) but it has also been applied to **C. aquatilis** Wahl.

57. *C. variabilis* Bail.=**C. aquatilis** Wahl.

59-60. *C. decidua* and *C. Goodenovii* are names of various and confused application, now reduced to synonomy. The former name in Henry probably covers the two very closely related sp. **C. Kelloggii** W. Boott and **C. Hindsii** C. B. Clarke. The former has the perigynia light green, or in age glaucous-green; nerved; very minutely granular; scales long-persistent; the latter, one of the commonest and most widely distributed sp. in the province, has the perigynia yellowish-green; ribbed; papillate-roughened; scales early deciduous.

63. **C. stenochlaena** (Holm) Mack. The type is from Chilliwack (J. M. Macoun); The plant figured in Mack. Ill. is from Glacier; abundant on Sinkut Mt., Vanderhoof (DA). Anderson includes this sp. in **C. scirpoidea** Michx.

65. **C. filifolia** Nutt. Tranquille (DA); Osoyoos (DA).

75. **C. ablata** Bailey. Type from Mt. Mark, V.I. (Macoun); Forbidden Plateau, V.I. (PM); Marie L., Garibaldi (DA); Manning Park, Hope-Princeton (PM).

81. *C. albicans* Willd. is an eastern sp. but the name has been applied to **C. Peckii** Howe, a B.C. sp. to which Henry's description applies.

82. M. retains **C. umbellata** Schk. and makes *C. abdita* Bickn. a syn.

83. **C. Richardsonii** R. Br. is not credited to B.C. in M. but was collected at Vanderhoof (DA) in lat. 54.

84. **C. concinna** R. Br. Fairmont, Columbia Valley (DA); Fort St. James (DA).

85. **C. concinnoides** Mack. Stigmas usually 4, a very exceptional character. Pritchard (DA); Kamloops (DA); Nelson (DA).

86. *C. communis* Bail. is an eastern sp. not given from w. of Minn. in M. What B.C. sp. the name was applied to, probably cannot now be determined.

87. *C. vespertina* Howell=**C. inops** Bailey.

88. **C. flava** L. Gray Ck., Kootenay L. (DA); Yoho (DA); Big Bend at Bush R. (DA). var. *rectirostrata* Bail.=**C. viridula** Michx., one of the

commonest and most widely distributed sp. in the province; spikes smaller; beaks of perigynia shorter (0.5-0.75 mm. as against 2-3 mm.) and less deflexed.

89. *C. Oederi* Retz. as distinct from the two preceding, is a sp. of the Atlantic Coast only, but the name has been, and apparently still is used by some authors to include **C. viridula.**

91. **C. atrata** L. is recorded by Ulke from Yoho.

var. *ovata* Boott=**C. atratiformis** Britt. occurs in Yukon and Alta., so possibly in B.C.

var. *nigra* Olney=*C. Helleri* Mack. a sp. of Nev. and Calif. only. Given presumably on the record in Macoun Cat. A. E. Porsild informs me that the specimens so named in Can. Nat. Herb. are **C. atrosquama** Mack.

92. **C. media** R. Br.

C. angarae Steud. is the name mostly used in recent years.

C. norvegica Retz. ssp. *inferalpina* (Wahl.) Hult. in Anderson (F. of Alaska).

C. Vahlii Schk. in M.

C. Halleri Gunn

Frequent; Mt. Apex, Penticton; Manning Park, Hope-Princeton; Monashee Pass; Paradise Mine, Windermere; descends to highway levels in Yoho Park and n. of Topley, lat. 54½, but usually alpine.

95. **C. stylosa** C. Meyer. Hollyburn Ridge, W. Vancouver (DA).

96. *C. vaginata* Tausch.=**C. saltuensis** Bail. Fairmont (DA); Yoho (DA); betw. Field and Golden (DA).

98. **C. eburnea** Boott. Fairmont, Columbia Valley (DA).

100. **C. capillaris** L. Fairmont and Canal Flats, Columbia Valley (DA); Yoho (DA); Blackwater L., Big Bend (DA); Topley (DA).

103. *C. heteroneura* Boott. This record appears to be taken from Macoun Cat. IV: 135 (1888). M. gives the sp. only from Calif. and Nev. but the name has been applied to **C. atrata** L.

105. **C. livida** (Wahl.) Willd. Not common; Calvert Is. (PM); Blackwater L., Big Bend (DA).

106. **C. amplifolia** Boott. Vancouver (DA); Nelson (DA).

107. *C. salina* var. *robusta* Bail. This collection by Macoun, the type of the var., is rather fully discussed, with various opinions of authorities, in Macoun Cat. IV: 147. M. refers it to **C. Lyngbyei** Hornem.

108. **C. physocarpa** Presl. Forbidden Plateau, V.I.; common on Hollyburn Ridge, West Vancouver; Bush R., Big Bend Highway; Mirror L., Kaslo.

109. *C. saxatilis* L. according to M. is confined to Eurasia, Greenland and Labrador. The name, however, has been applied to the last, and in fact is so used by Mackenzie in Rydberg's F. Rocky Mts.

112. **C. retrorsa** Schk. Common in the Interior; Quesnel, lat. 53 (DA).

115. **C. rostrata** Stokes. One of the commonest sp. throughout the province extending north to Alaska.

Additional Species

An attempt has been made, where possible, to relate these to species given in Henry's Flora

C. angustior Mack. Close to **C. cephalantha,** from which it differs in having the perigynia lanceolate, not ovate; the beak longer (more than half length of body) and obscurely instead of strongly serrulate; leaf-blades only 0.75-2 mm. wide. Newf. to B.C., s. to D.C. and Calif.

C. phyllomanica W. Boott. Close to the preceding. Culms 25-60 cm. tall; spikes 3-4, approximate in a head 15-35 mm. long, the terminal pistillate at tip and short-clavate at base, the lateral suborbicular with 8-15 widely separated perigynia; scales ovate, obtuse, two-thirds the length of perigynia body, chestnut-brown with lighter centre and hyaline margins,

midvein obscure at apex; perigynia ovate-lanceolate, broadest near the base, plano-convex, 3.75-4.5 mm. long by 1.5 wide, thick, conspicuously striate on both faces, entire, tapering into a sharply serrulate beak nearly half as long as the body, bidentate with short teeth; achene lenticular; stigmas 2. Swamps along the Coast, Alaska to Calif.

C. albonigra Mack. In the same group as **C. atrata** but terminal spike with pistillate fls. at apex; spikes mostly 3, approximate or lowest slightly separate, the lowest short-peduncled, narrowly oblong, 8-10 mm. long by 4 wide, with about 8-15 appressed perigynia; scales broadly ovate, black, with conspicuous shining white upper margins; perigynia broadly ovate, much flattened, 3 mm. long, 2 wide, blackish, membranaceous, nerveless, puncticulate, very abruptly contracted into an obscurely bidentate beak, barely 0.5 mm. long. Mts., Alta. to Wash., s. to Ariz. and Calif. Black Tusk, Garibaldi (DA); Paradise Mine, Windermere (DA); Anahim L., Chilcotin (DA).

C. atrosquama Mack. Resembling the last, from which it differs in having the perigynia slightly inflated and subtriangular instead of flattened at maturity, and scales black; spikes 3-4, the lower on erect peduncles half to twice their length. Mt. meadows, Alta. to B.C., s. to Mont., Ida., and Ore. Yoho (PM); Elk R. Valley, Kootenay (Pullman).

C. atherodes Spreng. Resembling **C. exsiccata** but sheaths soft-pubescent, and usually the underside of the leaves, at least near the base, sparsely so; upper 2-6 spikes staminate, 4-10 cm. long, lower 2-4 pistillate, or staminate at tip, 5-12 cm. long; lowest bract sheathing; perigynia 30-100 in a spike, 7-10 mm. long, glabrous, lanceolate, inflated, strongly ribbed, beak bidentate with teeth 1-3 mm. long. Marshes, Ont. to Yukon, s. to N.Y. and Ore.; Eurasia. Penticton (DA); Lac la Hache (PM); Vanderhoof (PM).

C. Crawei Dewey. Rootstocks long, horizontal, slender; culms 1-3 dm. tall, leafy at base; leaves stiff, 1-5 mm. wide; terminal spike staminate, 10-30 mm. long; lateral spikes 2-4, pistillate, 10-30 mm. long by 5-6 wide, the lowest often appearing basal; bracts leaf-like, the upper reduced; the lowest strongly sheathing; scales reddish brown with hyaline margins and 3-nerved green centre; perigynia 10-45 to a spike, 3-3.5 mm. by 1.25-2, ascending, suborbicular in cross-section, submembranaceous, light or yellowish green, roughened, many-nerved; beak short, hyaline, entire or minutely dentate; achene triangular; stigmas 3. Moist ground, Que. to Alta. and Wash., s. to N.J. and Wyo. Golden, J. K. Henry (PM); Wapta, Yoho, W. C. McCalla (DA).

C. Eleocharis Bail. Related to **C. Douglasii** from which it differs in the heads being staminate at the tip, and the perigynia smaller (3 mm. long) with a beak only 0.5-0.75 mm. long as against 2 mm. Dry places, Man. to Yukon, s. to Ia. and Ore. N. of Natal, Crow's Nest Pass (Pullman); Field (DB).

C. Garberi Fern. Related to **C. aurea** but pistillate spikes more closely-fld. and perigynia not becoming orange-yellow and fleshy when mature, but dry and whitish-papillose; inner summit of foliaceous bracts V-shaped; spikes closely crowded and imbricated, the terminal pistillate, or staminate only at tip; scales of pistillate spikes membranaceous, broadly oblong or ovate to obovate, mostly rounded at tip (rarely acute) or short-mucronate, 1.5-2.5 mm. long; lowest scales of terminal spike obtuse or acute, 2-3.5 mm. long; principal staminate scales broadly rounded at tip with pale scarious margins. The western form is var. **bifaria** Fern, with weaker, flexuous stems, fewer fld. and shorter spikes (0.5-2 cm. long) and less approximate chestnut-colored scales. Field (DA); Manning Park, Hope-Princeton (PM); Barkerville (DA); Ootsa L. (DA).

C. Hassei Bail. Very closely related to the last, which has only recently been separated from it. Differs in having the inner summit of the foliaceous

bracts truncate; spikes mostly remote, the terminal usually staminate throughout; scales of fertile spikes firm, ovate, mostly acuminate or with long awns, 2-4 (-6) mm. long; lowest scales of terminal spike firm, 3.5-5 mm. long, acuminate; principal staminate scales narrowed above to blunt tips, not white-margined. The range of **C. Hassei,** as now defined, is uncertain and may not extend into B.C.

C. incurviformis Mack. Very close to **C. incurva** but a smaller plant; culms 2-6 cm. tall, erect or curved, smooth; spikes few, staminate at tip, bractless, in a head 6-9 mm. by 5-8; scales with brown margins and lighter centre; perigynia few, 3.25 mm. by 1.25, shining, impressed-nerved, dark chestnut-brown, short-stipitate; beak 1 mm., bidentate; achene lenticular; stigmas 2. Alpine, Alta. and B.C. Paradise Mine, Windermere (PM) at 8000 ft.

C. leptopoda Mack. Distinguished from **C. Deweyana** by the slender, elongate rootstocks, perigynia smaller (3.5-4 mm. long) and stipitate at the base, and from **C. Bolanderi** by the spikes being thicker (ovoid or oblong), the upper part of the perigynium body not covered by the scale, the beak very shallowly bidentate (deeply so in **Bolanderi**). The description of **C. Deweyana** in Henry seems to fit this rather better. All three occur in B.C. Rossland (DA); Nelson (DA); Gray Creek, Kootenay Lake (DA).

C. loliacea L. related to **C. canescens** (perigynia white-puncticulate). Loosely tufted with slender light-brown stolons; culms 2-4 dm. tall; blades 0.5-2 mm. wide; sheaths tight, hyaline, prolonged; spikes 2-5, pistillate at tip, in an interrupted head 10-25 mm. long; lowest bract 2-8 mm. long, the upper scale-like; scales obtuse or acutish, keeled, thin, white-hyaline with green midrib; staminate fls. inconspicuous; perigynia 3-8 to a spike, 2.5-3 mm. by about 1.5, exceeding the scales, ascending or spreading, thick plano-convex, subcoriaceous, light green, finely ribbed, sharp-edged above, stipitate, beakless; achene lenticular; stigmas 2. Alaska to B.C. and Alta. Telegraph Ck. lat. 57 (DA); the plant figured in Mack. Ill. was collected by Henry at Hazelton, lat 55.

C. pedunculata Muhl. Close to **C. concinna** and **C. concinnoides** but with basal spikes as in **C. Rossii.** Upper leaves of fertile culms bladeless; sheaths loose; terminal spike staminate (or pistillate below); lateral spikes 3-4, pistillate or (usually) staminate at tip; scales cuspidate or awned, ciliate, purple with 3-nerved green centre; perigynia 1-8 in a spike, 3.5-4.5 mm. by 1.5, sharply 3-angled, deep green, minutely puberulent; beak minute, entire; stigmas 3. Woodlands, Newf. to B.C., s. to Va. and S.D.

C. petricosa Dewey. Related to **C. ablata.** Tufted, with long stolons; culms 15-25 cm. tall; leaves clustered near the base, 2-2.5 mm. wide; terminal spike pistillate below, 18 mm. long; lateral spikes 2-3, pistillate, 8-15 mm. long by 4 wide; lowest bract with a sheath about 1 cm. long; scales obtuse to acute or the staminate cuspidate, purplish-black with lighter centre, the staminate with white-hyaline margins, the pistillate ciliate and hyaline towards apex; perigynia 8-20 in a spike, 4-5 mm. long, appressed, flat, membranous, thin, straw-colored at base, purplish-black above, minutely hispidulous, ciliate, finely nerved, stipitate, beakless or nearly so; achene triangular; stigmas 3. Mt. summits, B.C. and Alta.

C. pseudoscirpoidea Rydb. Close to **C. scirpoidea,** from which it is distinguished by the culms having 6-10 well-developed leaves (2-4 in **C. scirpoidea,** with lower leaves reduced to sheaths); scales longer and covering the perigynia, and brownish-black in color; perigynia more strongly pubescent and reddish-brown above. Dry mt. sides, Mont. to Wash., s. to Colo., U., and Nev. Mackenzie does not include B.C. in the range but there is a specimen from Yoho in PM identified by him as this sp.

C. saximontana Mack. Very close to **C. Backii** but perigynia shorter (4 mm.) with a short (1 mm.), sparingly serrulate beak instead of a long

(2 mm.), smooth one; leaves glaucous green instead of deep green. Dry woods, Man., Minn., and Neb., w. to U., Ore., and B.C.

C. Sprengelii Dewey. Glabrous, light green, culms very slender, roughish above, erect, 25-90 cm. tall, strongly fibrillose at base; leaves flat, 2.5-4 mm. wide, usually not exceeding culms; bracts similar, shorter, short-sheathing; staminate spikes 1-3, slender-stalked, rarely pistillate at base; pistillate spikes 2-4, oblong-cylindric, 10-40-fld., 2-5 cm. long, 6-10 mm. thick, erect or drooping, filiform-stalked or the uppermost nearly sessile; scales lanceolate, acute to long-acuminate, scarious-margined; perigynia ascending to somewhat spreading, the body 2.5-3 mm. long, smooth, short-oblong, slightly inflated, pale, strongly 1-nerved on each side, contracted into a slender beak 1-2 times as long, at length deeply bidentate; stigmas 3. N.B. to Alta., s. to N.J. and Colo. Prince George (DA).

C. stygia Fries. Close to **C. limosa** and **C. paupercula.** Rootstocks long, slender, dark-purple, scaly, fibrillose, usually bulbous-thickened at the nodes; culms 2-6 dm. high, dark-purplish and clothed with old leaves at base; well-developed leaves 3-5 to a culm on lower fourth; blades 2-4 mm. wide, margins revolute; terminal spike staminate, 10-25 mm. long; lateral spikes 1-2, pistillate, 12-20 mm. by 6-8, drooping on capillary peduncles; bracts leaflet-like, dark, auricled, sheathless; staminate scales obtuse, dark reddish-brown with white-hyaline margins and lighter centre; pistillate scales acute to cuspidate, black with lighter midrib; perigynia 10-25 to a spike, 4-4.5 by 2 mm., appressed-ascending, flattened-suborbicular-triangular, coriaceous, glaucous-green or whitish, papillate, 2-edged, strongly nerved, beakless, orifice entire; achene triangular; stigmas 3. Boggy places near the Coast, Wash. to St. Lawrence Is. Calvert Is. (PM); Forbidden Plateu, V.I. (PM); Q.C.I. (M).

C. tenuiflora Wahl. Related to **C. canescens** (perigynia white-puncticulate). Loosely caespitose and stoloniferous; culms very slender, 15-60 cm. tall; leaves 0.5-2 mm. wide, soft, flat or canaliculate; spikes 2-4, pistillate at tip, subglobose, few-fld., 4-9 by 3-6 mm., in an ovoid or suborbicular head 6-12 mm. long; bracts scale-like or the lower prolonged; scales obtuse, whitish, with a 3-nerved centre; staminate fls. inconspicuous; perigynia 3-15 to a spike, concealed by the scales, 2.5-3.5 mm. long, narrowed at both ends, obscurely nerved; achene lenticular; stigmas 2. N.B. to Alta., s. to Me. and Minn.; Eurasia. Reid L., n.w. of Prince George, lat. 54 (DA).

C. vulpinoidea Michx. Resembling **C. stipata** but smaller in all its parts and with conspicuous bristle-like bracts interspersed in the head. Leaf-blades 2-5 mm. wide, some exceeding the culms; sheaths tight and *cross-rugulose ventrally;* head 3-10 cm. long, of very numerous, closely aggregated spikes, staminate at tips; scales rough-awned, yellowish-brown with hyaline margins; perigynia 2-2.5 mm. long, plano-convex, yellowish-green, membranous, 1-3-nerved dorsally, ascending or spreading at maturity, abruptly contracted into a bidentate beak 1 mm. long; achene lenticular; stigmas 2. Swamps, Newf. to B.C., s. to Fla., Tex., and Ore. Goldstream, V.I. (PM); Creston (DA).

Section **Acutae**

Spikes several; terminal one staminate (rarely pistillate at tip); lateral ones elongate and many flowered; achenes lenticular; stigmas 2; bracts usually sheathless.

A. Strongly stoloniferous, culms solitary or few together, low; lowest bract shorter than the culm; midvein of pistillate scales obsolete or slender. No. 51 belongs here also.

C. campylocarpa Holm. Culms 3-6 dm. tall; *sterile shoots without leaf-blades at base;* blades 1.5-3.5 mm. wide; terminal spike staminate, 6-20 by 3-5 mm.; lateral spikes 2-3, pistillate, 5-20 by 4.5-6 mm.; lowest bract leaflet-like, sheathless, purplish-black at base, the upper reduced, black-

auricled; scales obtuse or acute; perigynia 10-30 to a spike, 3-3.75 by 1.5-1.75 mm., *curved outwardly, convex dorsally, deeply concave ventrally, slightly turgid,* membranous, dull green below, purplish or purplish-mottled above, granular, 2-ribbed, substipitate; beak 0.2 mm. long, black, entire. Mt. meadows, Wash. to Calif. Mt. Brent, Penticton (DA).

C. gymnoclada Holm. Very close to the last. *Sterile shoots leafy at the base;* blades 2.5-5 mm. wide; terminal spike staminate, 10-30 mm. long; lateral spikes pistillate, or staminate at tip, 5-25 by 4-6 mm. long; lowest bract scale-like, sheathless, with black auricles; scales black with whitish midvein, margins somewhat hyaline; perigynia 8-50 to a spike, 2.25-3.5 by 1.5-2 mm., *flattened biconvex or plano-convex, not turgid;* beak 0.1-0.25 mm. Mt. meadows, Wash. to Calif., e. to Colo. Mirror Lake, Kaslo (DA).

C. miserabilis Mack. Culms 2.5-6 dm. tall; well-developed leaves 2-3 to a fertile culm (*lower with blades undeveloped but sheaths conspicuous*); *sterile shoots bladeless at base;* blades 3.5-5 mm. wide; terminal spike staminate, 10-15 mm. long; lateral spikes 2-3, pistillate, or staminate at tip, 7.5-30 by 6-8 mm.; scales obtuse or acutish, black, the staminate with hyaline margins; perigynia 10-40 to a spike, 2.5-3 by 1.5 mm., ascending, *plano-convex,* membranous, shorter than the scales, straw-colored at base, purplish-black-tinged above or throughout, granular, 2-ribbed, substipitate; beak 0.1-0.3 mm., entire, purplish-black. Wet places, Ore., Wash. and Ida. "Plentiful on open mt. top, 6500 ft." Mt. Brent, Penticton (G.V.C.). Although B.C. is not included in the range in M. the above specimen was so identified by Mackenzie.

C. scopulorum Holm. Differs from the preceding 3 sp. in that the dried first-year leaf-blades at base of fertile culm are stiff, rigid and conspicuous, concealing the culms; fertile culms with leaves all blade-bearing, the lower sheaths not purplish or hispidulous dorsally. Culms 1-4 dm. high; blades 3-7 mm. wide; terminal spike staminate, or partly pistillate, 10-25 mm. long; lateral ones 2-6, pistillate, or the upper staminate above, 12-25 by 6-7 mm.; lowest bract scale-like, not sheathing; scales black, shorter than the perigynia, sometimes with whitish midvein and margins; perigynia 2.5-3.5 by 1.5-2 mm., spreading, biconvex, *turgid,* membranous, purplish-black-spotted or mottled above, pale at base, papillose, 2-ribbed; beak 0.2-0.5 mm., entire, *usually recurved,* purplish-black. Closest to *C. concolor* (C. rigida) which has the perigynia not turgid, plano-convex, puncticulate, appressed. Wash. to Mont., s. to Colo. and Calif. Recorded by Ulke from Yoho and Horsethief Ck., Windermere.

AA. Culms taller, less stiff, in larger clumps; lowest bract equalling or often exceeding the culm; pistillate scales with slender midvein or broader light-colored centre. Nos. 45 and 54-59 belong here.

A key of all known B.C. sp. of this section follows.

a. Perigynia nerved or ribbed ventrally, the nerves raised.
b. Perigynia membranaceous, slenderly nerved, beak apiculate, entire; lowest bract exceeding the culm.
c. Lowest bract short-sheathing; scales brownish-red tinged ..... *C. lenticularis*
cc. Lowest bract sheathless or nearly so; pistillate scales blackish
d. Perigynia light-green or in age glaucous-green; nerved; very minutely granular; scales long-persistent ..... *C. Kelloggii*
dd. Perigynia yellowish-green; ribbed; papillate-roughened; scales early deciduous ..... *C. Hindsii*
bb. Perigynia coriaceous, strongly ribbed, the beak broad, bidentate; lowest bract about equalling the inflorescence ..... *C. nebraskensis*
aa. Perigynia nerveless ventrally or with obscure impressed nerves.
e. Perigynia turgid; scales divaricate ..... *C. aperta*
ee. Perigynia not turgid; scales appressed.

f. Sheaths usually dark-colored ventrally at mouth; lowest pistillate spikes usually nodding on long peduncles; pistillate scales whitened at tips especially in age; no long horizontal stolons.....*C. sitchensis*
ff. Sheaths not colored ventrally at mouth; lowest pistillate spikes not nodding; pistillate scales not whitened at tips; with long horizontal stolons.
g. Perigynia narrowly to very broadly elliptic, broadest below apex, less than 3 mm. long, 1-1.5 wide.....*C. aquatilis*
gg. Perigynia strongly obovate, broadest at apex, 3 mm. long by 1.75 wide .....*C. substricta*

C. lenticularis Michx. Culms 1-6 dm. tall, brownish and leafy at base; blades 1-2 mm. wide; terminal spike staminate or with a few perigynia, 8-30 mm. long; lateral ones 3-5, pistillate, 15-45 by 3-4 mm.; perigynia numerous, 1.8-3 mm. by 1-1.5, ascending, flattish, biconvex, ribbed on both faces, glaucous-green, yellow-gland-dotted, 2-edged, short-stipitate. Labrador and Newf. to Mack. s. to Mass. and Ida. B.C. is not included in range in M. but there is a specimen in PM from Yoho so identified by Mackenzie. Vanderhoof (Can.); Prince Rupert (Can.); 6 m. n. of Kingsgate (Pullman).

C. substricta (Kukenth.) Mack. Close to **C. aquatilis** but stronger growing (6-14 dm. high); leaves wider (up to 8 mm.); 1-3 staminate spikes. Newf. to Wash., s. to N.J., Ind., and Neb. Pass L., Kamloops (DA); Ft. Fraser (DA).

Section **Ovales**

Caespitose; spikes several, the lateral sessile, all more or less similar, with pistillate flowers at the tips; perigynia narrowly to broadly winged; achene lenticular; stigmas 2. The largest and perhaps the most difficult section, the distinction between accepted species being often small. Nos. 4-18 and 22 belong here. As the descriptions in Henry are inadequate with the increased number of species now recorded, a key is given of all known to occur in B.C.

A. Bracts either leaf-like or conspicuously exceeding the head.
B. Bracts leaf-like, many times exceeding the head.....*C. sychnocephala*
BB. Bracts conspicuously exceeding the head but not leaf-like.
C. Lowest bract appearing as a continuation of the stem, the head appearing lateral; perigynia not hyaline at apex.....*C. unilateralis*
CC. Lowest bract not so; head terminal; perigynia hyaline at apex *C. athrostachya*
AA. Bracts not leaf-like or conspicuously exceeding the head.
D. Perigynia with beak slender and nearly terete, scarcely margined at the tip, the upper 1-2 mm. little if at all serrulate, sometimes becoming bidentulate, rarely bidentate.
E. Perigynia 2.5-6 mm. long.
F. Scales shorter than perigynia and noticeably narrower above, largely exposing the perigynia above.
G. Perigynia membranaceous, much flattened, thin and scale-like except where distended by the achene.
H. Perigynia 3.5-5 mm. long, lightly few to several nerved ventrally, at least at the base; culms slender, 3-10 dm. high.
I. Perigynia strongly margined, ovate, appressed; scales dark-chestnut to brownish-black; culms annual or nearly so.....*C. festivella*
II. Perigynia very narrowly margined, lance-ovate, ascending-spreading; scales dull brown; culms biennial (base clothed with dried-up leaves of previous year) .....*C. microptera*

HH. Perigynia 4.5-6 mm. long, usually nerveless ventrally; culms low, 1-3.5 dm. high, ascending ..... *C. Haydeniana*

GG. Perigynia plano-convex.

J. Perigynia 3-3.5 mm. long.

K. Perigynia with margins of beak entire or nearly so; spikes capitate in a suborbicular head ..... *C. illota*

KK. Perigynia with margins of beak strongly serrulate; spikes aggregated but well-defined; culms smooth ..... *C subfusca*

JJ. Perigynia 3.5-5 mm. long.

L. Perigynia deep green at anthesis, yellowish brown in age, not white-hyaline at apex ..... *C. Preslii*

LL. Perigynia copper-colored at maturity, strongly plano-convex, thick, the beak inconspicuously white-hyaline at apex ..... *C. pachystachya*

FF. Scales about length of perigynia and nearly the same width, concealing perigynia above or nearly so.

M. Beak of perigynia not white-hyaline at tip; culms 2-8 dm. high, leaves not bunched near the base ..... *C. Tracyi*

MM. Beak of perigynia white-hyaline at tip.

N. Culms and head stiff; culms 1-3 dm. high, in large clumps; scales strongly reddish-brown or darker; leaves bunched near the base ..... *C. phaeocephala*

NN. Culms slender, 2-8 dm. high; heads not stiff.

O. Spikes in a flexuous or moniliform inflorescence; perigynia 4.5-6.5 mm. long.

P. Pistillate scales dull light-reddish-brown, the margins broad silvery-white-hyaline; spikes usually 6-16 mm. long; stigmas light-reddish-brown ..... *C. praticola*

PP. Pistillate scales shining dark-chestnut-brown; spikes 10-18 mm. long; stigmas dark-reddish-brown ..... *C. Piperi*

OO. Spikes capitate or closely approximate except sometimes the lowest; perigynia 4-5 mm. long; pistillate scales dull-reddish-brown ..... *C. platylepis*

EE. Perigynia 6-8 mm. long, lanceolate, scales chestnut or reddish-brown ..... *C. petasata*

DD. Perigynia with beak flattened and serrulate to the tip, often strongly bidentate.

Q. Scales shorter than perigynia and noticeably narrower above, largely exposing perigynia.

R. Leaf-blades of sterile culms erect or ascending, usually clustered at the apex; sterile culms often poorly developed.

S. Leaf-sheaths strongly white-hyaline ventrally.

T. Perigynia subulate to narrowly ovate-lanceolate, 3-4 times as long as wide, thin and scale-like except where distended by the achene.

U. Perigynia subulate, the margin almost obsolete at base ..... *C. Crawfordii*

UU. Perigynia lanceolate, margin conspicuous to base ..... *C. scoparia*

TT. Perigynia ovate-lanceolate or broader, at most twice as long as broad.

V. Culms smooth; perigynia subcoriaceous with tip of beak a little flattened ..... *C. subfusca*

VV. Culms rough beneath head; perigynia membranaceous with beak flattened to tip.
W. Perigynia 3-3.5 mm. long, brownish at maturity (dull green when young); spikes closely aggregated, truncate or rounded at base ..... *C. Bebbii*
WW. Perigynia 3.5-4 mm. long, straw-colored at maturity (green when young); spikes usually in a moniliform infl. ..... *C. tenera*
SS. Leaf-sheaths (at least the uppermost) green and strongly nerved ventrally nearly or quite to the mouth ..... *C. feta*
RR. Leaf-blades of sterile culms widely spreading, numerous, not clustered at apex; sterile culms strongly developed; sheaths loose; perigynia somewhat abruptly narrowed near middle of body.
X. Tips of perigynia appressed or ascending; spikes suborbicular-turbinate to obovate-turbinate, 5-12 mm. long; leaf-blades firm; culms stiff ..... *C. tribuloides*
XX. Tips of perigynia loosely ascending to recurved; spikes suborbicular, not turbinate, 4-8 mm. long; leaf-blades flaccid; culms not stiff ..... *C. projecta*
QQ. Scales about length of perigynia and nearly the same width above, concealing the perigynia or very nearly so.
Y. Inflorescence stiff, spikes aggregated or approximate.
Z. Lateral spikes ovoid-elliptic, round-tapering at base; perigynia closely appressed; bracts not prominent *C. xerantica*
ZZ. Lateral spikes suborbicular, rounded at base; perigynia loosely ascending in age; lower 1-2 bracts prominent, stiff ..... *C. adusta*
YY. Inflorescence moniliform, not stiff ..... *C. aenea*

Descriptions of Additional Species

C. Bebbii Olney. Culms 2-8 dm. high; spikes 3-12, 4-9 mm. long by 3-6 wide, brownish, closely aggregated, rounded at base, many-fld., in a head 15-25 mm. long; perigynia narrowly ovate, 3-3.5 mm. long by 1.5-2 wide, tapering to a bidentate beak half the length of the body, flattened and serrulate nearly to the tip. Newf. to B. C., s. to N. J. and Wash. Frequent throughout the province.

C. Haydeniana Olney
C. festiva var. *Haydeniana* W. Boott
C. nubicola Mack.
Culms smooth or nearly so; leaf-blades 2-3 mm. wide; head 12-18 mm. long by 9-18 wide, of 4-7 densely aggregated ovoid or subglobose spikes; spikes with 15-35 ascending perigynia with spreading beaks; bracts inconspicuous; scales ovate, acute, blackish with lighter centre and hyaline margins; perigynia ovate, very flat and strongly winged, dark-tinged, rounded at base, abruptly contracted into a serrulate, bidentulate beak, one-half the length of the body. Alta. s. to Colo. and w. to Ore. Paradise Mine, Windermere at 8000 ft. (PM); Yoho at 5000 ft. (DA).

C. microptera Mack. Culms 5-10 dm. high, smooth; spikes 5-10, closely aggregated; bracts little developed; scales ovate-lanceolate, shorter than the perigynia; perigynia 3.5-4.5 mm. by 1-1.5; beak one-third to one-half the length of the body, serrulate. Alta. to Wash., s. to Wyo., Nev., and Ore. Elgin (DA); Nelson (DA); Gray Ck., Kootenay L. (DA); Vancouver (DA).

C. platylepis Mack. Culms 4-7 dm. high, slender, weak, roughened beneath the head; well-developed leaves 3-5 to a culm, on lower third; sterile shoots elongate, conspicuous; head ovoid or oblong, 15-35 mm. long by 12-18 wide; spikes 5-8, 7-12 mm. long by 5-7 wide, rounded or short-tapering at base; rounded or slightly pointed at apex; perigynia 15-40, appressed-ascending; bracts usually scale-like; scales ovate, obtuse or acute, very membranaceous and closely appressed, with green 1-3-nerved centre and white-hyaline margins; perigynia thin, membranaceous, obscurely nerved dorsally and towards base ventrally, dull greenish when young, yellowish-brown when mature, round-tapering at base, nearly sessile, winged nearly to base, upper one-third to one-half of body as well as beak serrulate; beak 1-1.5 mm. long, strongly white-hyaline at apex. Dry pine and spruce woods in the mts.; Wyo., Mont., Ida., Alta. and eastern B. C.

C. Preslii Steud. Culms 2.5-7 dm. high; spikes 3-8, well-defined, the lower often separate, rounded at both apex and base, the terminal one short-tapering at base; head 12-20 mm. long, by 6-10 wide; scales ovate, acute; perigynia ovate with spreading tips, about 3.5 by 2 mm., green or yellowish brown in age, strongly winged. Alta. and Mont. to B. C. and Calif. Type from Nootka; Mt. Revelstoke (DA); Nakusp (DA).

C. projecta Mack. Culms 4-9 dm. high, slender, weak; spikes 8-15, straw-colored, greenish or brownish, suborbicular, 4-8 mm. long and nearly as broad, alternately and usually loosely arranged in a slender moniliform infl. 3-5 cm. long; perigynia lanceolate, 3-5 mm. long by 1.5 wide, straw-colored, nerved on both faces, serrulate, stipitate; beak 1-2 mm. long, flat, serrulate, reddish-brown tipped. Newf. to B. C., s. to D. C. and Ia. Boat Encampment, Big Bend Highway (DA).

C. scoparia Schk. Culms 1.5-8 dm. high; spikes 3-12, 6-16 mm. long by 3-9 wide, narrowed at base and often at apex also, often well separated in a moniliform infl.; perigynia lanceolate, 4-6.5 mm. by 1.2-2, flat, membranous, greenish-white or straw-colored, nerved on both faces, wing-margined, serrulate; beak 1.25-2 mm., flat and serrulate to the tip. Newf. to B. C. and s. to S. C. and Ore. "Adventive in B. C." (M); introduced with cranberry plants at Ucluelet, V. I. (PM. Cat.); Goldstream, V. I. (G.V.C.).

C. subfusca W. Boott. Culms smooth or nearly so, the basal leaves with well-developed blades; head oblong or ovoid, 10-20 mm. long, spikes 4-12, well-defined but closely aggregated, 4-10 mm. long by 2.5-4.5 wide, rounded at apex, rounded or somewhat tapering at base; perigynia 8-14 to a spike, appressed, ovate, 3-3.5 by 1-1.5 mm., thickish, subcoriaceous, greenish or straw-colored, winged to a rounded base, serrulate above, finely nerved; beak 1 mm. serrulate, somewhat flattened nearly to tip; scales shorter than perigynia, ovate, acute, brownish with lighter midvein and inconspicuous hyaline margins. Ore., Calif., and Ariz. Near Second Narrows Bridge, North Vancouver (DA).

C. Tracyi Mack. Culms 2-8 dm. high; spikes 4-7, 7-15 mm. long by 5-9, in a head 15-40 mm. long; scales acute, dull reddish-brown with white-hyaline margins and lighter centre and conspicuous white tip; perigynia 4-5 by 2.25 mm., appressed-ascending, concealed by the scales, membranous, green or yellowish-brown, strongly nerved, serrulate above, substipitate; beak 1.75-2 mm., serrulate below, bidentulate, reddish-brown-tipped with hyaline orifice. Calif. to B. C. Nanaimo, V. I.; Royston, V. I.; New Westminster; Elgin; Monashee Pass; Nelson. Henry's description of **C. phaeocephala** apparently includes this, which was not published until 1922. **C. phaeocephala,** as now understood, is a high alpine with culms only 1-3 dm. high; Black Tusk, Garibaldi; Mt. Brent, Penticton; Paradise Mine, Windermere; Manning Park, Hope-Princeton.

C. tribuloides Wahl. Resembling **C. Bebbii** but heads usually larger 25-50 mm. long, with 6-15 spikes 5-12 mm. long by 4-8 wide; perigynia

lanceolate, 3-5 by 1-1.5 mm. The western limit of this is given in M. as Wisc., Minn., and Ia. but specimens from Nelson and Creston (DA) have been referred to this sp.

C. unilateralis Mack. Resembling **C. athrostachya** from which it was not separated until 1922. Differs in the lowest bract appearing like a continuation of the stem, the head attached laterally; beak of perigynium reddish-tipped without a hyaline margin at the orifice. West of the Cascades, B. C. to Calif. Probably most records of **C. athrostachya** from the coastal region are this sp.

C. xerantica Bail. Culms 3-6 dm. high with 2-3 well-developed leaves clustered near the base; spikes 3-6, 8-14 mm. long (or the terminal longer) by 5-8 wide, in a head 3-5 cm. long; scales acutish, light reddish-brown with white-hyaline margins; perigynia 4-5.5 by 2-2.5 mm., appressed, concealed by the scales, greenish, lightly nerved dorsally, serrulate; beak 1-1.3 mm. long, flat, serrulate, the orifice white-hyaline. Man. to Alta., s. to N. Mex. Penticton (DA).

CYPERUS

C. inflexus Muhl.
C. aristatus Rottb.
Not common; Great Central Lake, V. I. (U); Okanagan L., at Penticton (DA); abundant at Osoyoos L. (DA); mud flats, Kamloops (PM).

ELEOCHARIS

E. compressa Sull.
E. acuminata (Muhl.) Nees
Perennial by rootstocks; culms somewhat flattened, striate, slender, 2-5 dm. tall; spikelet ovoid or oblong, obtuse, thicker than the culm, 6-12 mm. long; scales ovate-lanceolate to oblong, acute or lower obtusish, purple-brown with greenish midvein and hyaline margins; bristles 1-5, mostly shorter than the achene, fugacious or wanting; stamens 3; *style 3-cleft;* achene obtusely 3-angled, obovoid, light yellowish-brown, *papillose,* much longer than, and *distinct from,* the depressed-conic tubercle. B. C. to Que., s. to Mont. and Ga. Swamp at Kinbasket, Big Bend Highway (DA).

ERIOPHORUM

This genus has been intensively revised since Henry's Flora was published and it has been necessary to re-write this section. Little is known of the distribution within the province of some of the species; probably they occur chiefly in the northern areas.

A. Spike solitary.
B. Bristles 6 ..... *E. alpinum*
BB. Bristles numerous.
C. Plants stoloniferous.
D. Anthers 0.5-1 mm. long; scales with very narrow pale margins. *E. Scheuchzeri*
DD. Anthers 2-3 mm. long; scales broader with wide hyaline margins; bristles usually brownish ..... *E. Chamissonis*
CC. Plants densely tufted and without stolons.
E. Scales grey, translucent ..... *E. vaginatum*
EE. Scales greyish or greenish-black, not translucent.
F. Plants 6-20 cm. tall ..... *E. callitrix*
FF. Plants 30-70 cm. tall ..... *E. opacum*
AA. Spikes more than one.
G. Leaf-blades triangular-channeled throughout ..... *E. gracile*
GG. Leaf-blades flat below the middle.

H. Midrib of scales prominent to the tip.....*E. viridi-carinatum*
HH. Midrib of scales not prominent to tip.....*E. angustifolium*

E. alpinum L.=*Scirpus Hudsonianus* (Michx.) Fern.

E. Scheuchzeri Hoppe. Stems slender, 20-60 cm. tall; sheaths all blade-bearing except the uppermost; blades filiform, channeled, shorter than the culm; spike erect, globose at maturity; bristles numerous, white or drying yellowish, 15-30 mm. long; achene narrowly oblong, acute, with a subulate beak, scarcely 2 mm. long.

E. Chamissonis C. A. Meyer
E. russeolum Fries
Resembling the last but taller (30-70 cm.); upper sheaths somewhat inflated; achene broader and narrowed at the base; bristles 2-4 cm. long. Common in bogs throughout. A form with pale to white bristles is distinguished as var. **albidum** Fern.

E. vaginatum L. Densely tufted; culms stiff, obtusely triangular, 20-50 cm. tall; leaves filiform, triangular, channeled; upper sheaths inflated; spike oblong, 1-3 cm. long; scales ovate-lanceolate, acuminate, thin, mostly hyaline; bristles white or slightly dingy, 10-16 mm. long; achene narrowly ovoid, scarcely apiculate.

E. callitrix Cham. Usually one sheath to a culm, near the base, often bearing a short blade; leaves rigid, spreading, the blades forming an angle with the sheath; scales nearly uniform in color; bristles pure white. An arctic sp. which may extend into B. C. The sp. under this name is Henry is probably the next.

E. opacum (Bjornstr.) Fern. Densely tufted; culms 30-70 cm. tall; basal leaves elongate, continuous with the sheath; uppermost sheaths scarcely inflated; scales dark, ovate-lanceolate or the inner linear-lanceolate, acuminate; bristles white or slightly brown-tinged, 10-20 mm. long; achenes obovate-oblong, smooth, conspicuously apiculate. Yoho (DA); between Topley and Babine Lake, lat. 54 (DA).

E. gracile Koch. Culms slender, smooth, terete, 30-60 cm. tall; all sheaths blade-bearing, the blades narrowly linear, not over 2 mm. wide; spikes 2-6, some of them on slender, drooping, pubescent peduncles; scales ovate with prominent midribs; bristles white, 15-25 mm. long; achenes linear-oblong, about 2.5 mm. long.

E. angustifolium Roth.
E. polystachion L. is an Old World sp. to which this was formerly referred.
Culms smooth, obtusely triangular, 30-70 cm. tall; sheaths loose, all bearing blades 3-8 mm. wide; bracts 2-4, the lowest equalling or exceeding the infl.; spikes 2-12 in a terminal umbel; peduncles smooth, slender, drooping; scales ovate-lanceolate, purplish-green to brown; bristles white or somewhat tawny, up to 3 cm. long; achenes sharp-pointed, about 2.5 mm. long. Common throughout, usually in subalpine bogs.

E. viridi-carinatum (Engelm.) Fern. Resembling the last; leaves thin, flat, black at base; spikes usually numerous (up to 30); peduncles finely hairy, elongated or short; scales ovate-lanceolate, the midvein extending to the tip and sometimes excurrent; achenes oblong-ovoid; bristles white or slightly yellowish.

SCIRPUS

S. Hudsonianus (Michx.) Fern.=**Eriophorum alpinum** L.
S. nanus Spreng.=**Eleocharis parvula** (R&S) Link.
S. occidentalis (Wats) Chase=**S. acutus** Muhl.
S. pauciflorus Lightf.=*Eleocharis pauciflora* (Light.) Link of some recent authors.
S. riparius Spreng.=**S. cernuus** Vahl.

S. caespitosus L. The N. Am. plant is separated as var. **callosus** Bigel. Widely distributed from V. I. (Mt. Arrowsmith and Forbidden Plateau) to Newf.; abundant on Hollyburn Ridge, West Vancouver.

S. nevadensis S. Wats. Apparently rare in B. C. Kamloops (DA); seashore Sea Island, Vancouver (DA), possibly brought down from the Interior by the Fraser R.; Green L., lat 51½, is our most northerly record.

S. robustus Pursh is an eastern sp. The one given under this name in Henry is **S. paludosus** A. Nels. (including *S. pacificus* Britt.).

S. atrovirens Muhl. is an eastern sp. and there appears to be no recent record of its occurrence so far west. Piper's records (F. of Wash.) are apparently now referred to *S. pallidus* (Britt.) Fern., a sp. not so far recorded from B. C.

S. cyperinus (L.) Kunth. (Wool-Grass). Closest to **S. microcarpus** but the bristles smooth instead of downwardly barbed, and at maturity much exceeding the achenes, forming a reddish-brown, tangled, woolly mass. Matsqui, W. Jones (DA); much west of its range which is given as Newf. to Sask. and southwards.

S. rubiginosus Beetle. A recently described sp. very close to **S. acutus** but differing in having the styles 3-fld (sometimes both 2- and 3-fld in the same spikelet); scales equalling the achene instead of longer; spikelets somewhat differently shaped. Brackish water of coastal estuaries from V. I. to Calif.

ARACEAE

ACORUS

Erect herbs with horizontal branched rootstocks, sword-shaped leaves, and a 3-angled scape with a seemingly lateral cylindrical spadix. Flowers perfect, densely covering the whole spadix. Sepals 6, concave. Stamens 6; filaments linear; anthers kidney-shaped, 1-celled when mature. Ovary 2-3-celled with several pendulous ovules in each cell. Fruit 2-3-celled, gelatinous inside, 1-few-seeded. Two sp. the other being Japanese.

A. Calamus L. (Sweet Flag). Leaves linear, erect, 3-18 dm. long and up to 2.5 cm. wide, 2-ranked, closely sheathing each other; spadix 5-8 cm. long and about 1 cm. thick; spathe appearing as a leaf-like continuation of the stem. Eurasia and eastern N. Am. but known to occur in Sask. and Alta. Shore of Shuswap Lake near Tappen (DA); said to cover about 2 acres, flooded at high water, and away from cultivated land.

CALLA

C. palustris L. Probably extends across the province in lat. 54-55, since it is known from Prince Rupert, Hazelton, Burns Lake, Endako, Vanderhoof and Summit Lake, north of Prince George. Our most southerly record is Quesnel, lat. 53 (U).

LYSICHITON

The American plant is now considered distinct from the Asiatic sp. and is named **L. americanum** Hulten & St. John. The spelling **Lysichitum** is favored by recent authors.

JUNCACEAE

JUNCUS

2. *J. subtriflorus* (Mey.) Cov.=**J. Drummondii** Mey.

13. **J. alpinus** Vill. var. **insignis** Fries=*J. Richardsonianus* Schult. of many authors.

var. furcescens should read fuscescens.

15. **J. Torreyi** Cov. Winfield, Okanagan (DA); Osoyoos (DA).

17. **J. oreganus** S. Wats. A proliferous form with young plants developing in the fls. in place of capsules seems fairly frequent; Garibaldi (DA); Hollyburn Ridge, West Vancouver (DA); Shawnigan Lake, V. I. (DA).

19. *J. tenuis*=**J. macer** S. F. Gray.

24. **J. longistylis** Torr. Lac la Hache (PM); Manning Park, Hope-Princeton (PM).

Additional Species

J. albescens (Lange) Fern. An arctic-alpine sp. very close to *J. triglumis*, with which it has been confused until recently. Differs in having the lower bract long-acuminate or long-awned and equalling or exceeding the lowest flower; capsule thinner and usually paler in color, about half as long (3-4 mm.), included or barely exserted, and rounded to subtruncate at apex; seeds smaller (1.3-2 mm. long), smooth and brown. Yoho (DA). *J. triglumis* is an Old World sp. which possibly does not occur in N. Am. outside of Alaska.

J. articulatus L. 2-6 dm. high; *stem-leaves terete, conspicuously septate; infl. terminal,* 3-10 cm. long, *branches divaricate;* heads hemispheric to top-shaped, 6-12-fld.; perianth 2-3 mm. long, segments nearly equal, lanceolate, acuminate, brown or greenish; *stamens 6,* one-half to three-quarters as long as perianth; *anthers shorter than to equalling the filaments;* capsule little longer than the perianth, brown, 3-angled, *sharply acute,* tapering to a conspicuous tip, 1-celled; seeds about 0.5 mm. long, reticulate in 16-20 rows. Generally distributed throughout the province and extending across the Continent; Eurasia.

J. confusus Cov. Close to **J. macer**; stems slender, 4-5 dm. high, in small tufts; *leaves basal,* about two-thirds the length of the stems; blades almost filiform *with scarious white auricles;* inflorescence compact, 5-20 mm. long; longest bract 2-8 cm.; perianth 3.5-4 mm. long, pale; segments straw-colored, lanceolate to lance-ovate, acute, with a brown stripe on each, the margins broadly scarious; anthers shorter than the filaments; capsule oblong, a little shorter than the perianth, sharply 3-angled above and retuse at the apex, *completely 3-celled;* seeds apiculate at both ends with faint shallow reticulations. B.C.-N.M.-Neb.-Sask. (Rydberg).

J. Dudleyi Wieg. Resembling **J. macer,** but less common, though widely distributed.

Auricles at summit of the leaf-sheaths very thin, white, scarious, and prolonged as much as 15 mm. beyond the insertion of the blade.....*J. macer*
Auricles cartilaginous, opaque, yellowish or changing to brown with age, not much prolonged; inflorescence more contracted.....*J. Dudleyi*

J. Regelii Buch. Stems slender, erect, 15-20 cm. high, from stout root-stocks; *leaves flat, not septate;* basal ones grass-like; stem-leaves 1-3; *auricles rudimentary or absent; flowers aggregated into 1-5 heads,* 8-15 mm. wide; perianth 4-5 mm. long, *minutely roughened on the back;* outer segments ovate-lanceolate, short-acuminate, with very narrow scarious margins; inner ovate, obtuse, with broad scarious margins; stamens 6, about two-thirds as long as the perianth; anthers about equalling filaments; capsule ovoid, *nearly equalling perianth,* obtuse and slightly depressed, mucronate, brown, 3-celled; *seeds with a long white tail at each end.* B.C.-Wash.-Utah-Mont. (Rydberg). Southern V. I. (PM. Cat.).

J. saximontanus A. Nels. Differs from **J. ensifolius** chiefly in having 6 stamens instead of 3, and narrower leaves (2-4 mm. wide). B. C. to Ore., e. to Alta. and N. Mex.

LUZULA

L. saltuensis Fern. is an eastern sp. whose western limit is given as Sask., Mich. and Minn.

L. Piperi (Cov.) M. E. Jones=**L. Wahlenbergii** Rupr. in recent Floras; common in subalpine situations.

L. glabrata (Hoppe) Desv. Close to **L. parviflora** with which it is probably included in Henry. Differs in being glabrous (without long hairs at the junction of blade and leaf-sheaths); leaves somewhat broader (6-12 mm. as against 3-10); perianth somewhat longer (3-3.5 mm. as against 1.5-2.5). B. C. to Mont. and Ore. Mt. Arrowsmith, V. I. (PM. Cat.).

LILIACEAE

ALLIUM

A. Schoenoprasum L. var. **sibiricum** (L) Hartm.

A. sibiricum L.

An interesting difference between the floras of the Lower Arrow and Kootenay Lakes is the abundance of this plant in marshy ground on the shore of the former e.g. at Nakusp and Edgewood. I have never seen it around Kootenay L., but found a solitary plant at 4500 ft. above Nelson.

A. crenulatum Wiegand

A. vancouverense Macoun is a *nomen nudum.*

Since Macoun collected this on Mt. Arrowsmith, V. I. in 1887, only one new station appears to have been recorded in B. C. viz. Bald Mt., n. of Cowichan Lake, V. I.

A. amplectens Torr.

A. attenuifolium Kell.

Bulb ovoid, 15 mm. long, coats reddish, *reticulate with transverse V-shaped meshes often in perpendicular rows;* scapes 15-45 cm. tall, slender, terete; leaves 2-4, shorter than the scape, becoming convolute-filiform above the sheathing base; bracts 2, *scarcely 1 cm. long,* broadly ovate, rounded at apex and mucronate; umbel dense, almost capitate; pedicels 6-15 mm. long; perianth segments white or pink-tinged, oblong-lanceolate, acuminate, 6-8 mm. long, becoming lax in age; stamens almost as long as the perianth; *capsule distinctly 6-crested.* The range is given as southern Wash. to Calif. but there are specimens in PM from 10 different stations on southern V. I.

A. validum S. Wats. Close to **A. Schoenoprasum** var. **sibiricum** from which it differs in having the leaves flat or slightly keeled, not round and hollow; bulbs longer (3-5 cm.) and finely reticulate; pedicels longer (10-15 mm. as against 2-6); umbels erect, not nodding. Wash. to Calif. "Plentiful in running water at head of McIntyre Creek, Okanagan Falls, at 4500 ft." (G.V.C.).

CALOCHORTUS

The Three-spot Lily of East Kootenay, and extending west to Creston, is **C. apiculatus** Baker. *C. elegans* Pursh has a more southern range and is not likely to occur in B. C.

C. Lyallii Baker. A very local sp. of Southern B. C. to central Wash. Similkameen, Macoun (M. Ownby); the type, collected by Lyall, is also stated to be from B. C.

Petals pale yellow; obovate, sparsely hairy on inner surface, gland at base naked; capsule nodding in fruit ..... *C. apiculatus*

Petals white, tinged with bluish purple, narrowly ovate, ciliate on the margins, otherwise glabrous except for the doubly fringed lunate scale over the gland; capsule erect in fruit ..... *C. Lyallii*

DISPORUM

D. oreganum (S. Wats.) B&H. Although this sp. is given as ranging east to Ida. it appears to be rare east of the Cascades in B. C. McBride, lat. 53 (DA).

ERYTHRONIUM

The following changes in nomenclature are in accordance with the revision of the genus by E. I. Applegate, Madrono **3:** (1935).

1. **E. grandiflorum** Pursh. Var. *parviflorum* S. Wats. is not considered separable from the species, but three forms are recognised based on the color of the anthers. In the typical form these are red; in subsp. **chrysandrum** Appleg. golden yellow; in var. **pallidum** St. John white or nearly so. All three forms are found growing together at Kootenay Bay, Kootenay L.

1a. var. *albiflorum* Hook., probably better known as *E. giganteum* Lindl. has been re-named **E. oregonum** Appleg. on account of a long-standing error in regard to the type. var. *Smithii* Hook.=**E. revolutum** Smith.

2. **E. montanum** S. Wats. Mt. Waddington, Bute Inlet (Mainland); erroneously recorded in Applegate's memoir as Mt. Washington, V. I.

3. *E. Howellii S.* Wats. is of very doubtful occurrence in B. C. All plants seen by Applegate are from Oregon.

SMILACINA

The taxonomic status of **S. stellata** (L) Desf. appears to be very much a matter of opinion. Some recent authors retain it in the sense of Henry; others include in it **S. sessilifolia** (Baker) Nutt. as not distinct; others consider **S. stellata** as eastern only, and distinguish the western representative as *S. liliacea* (Greene) Wynd.

S. brachypetala Rydb. and *S. amplexicaulis* Nutt. are not considered distinct from **S. racemosa** (L) Desf. by recent authors.

STREPTOPUS

S. roseus Michx. is considered eastern only by most recent authors, **S. curvipes** Vail. being the western form.

S. streptopoides (Ledeb.) Frye and Rigg

Kruhsea streptopoides (Ledeb.) Kearney is preferred by some recent authors.

Not common; Mt. Cheam (U); above Nelson at 4500 ft. (DA).

TOFIELDIA

T. intermedia Rydb. is not considered distinct from **T. occidentalis** Wats. by most recent authors. Peck, however, gives var. *intermedia* (Rydb.) Peck.

XEROPHYLLUM

X. tenax (Pursh) Nutt. Common at altitudes of about 5000 ft. around Kootenay Lake, descending nearly to highway levels at Hall's Creek, Salmo.

ZYGADENUS

Z. elegans Pursh

Z. chloranthus Richards.

Crawford Bay and Kokanee Meadows (5000-6000 ft.), Kootenay L.; lakeshore, Robson; Canal Flats and Fairmont, Columbia Valley.

Z. paniculatus (Nutt.) Wats. Anarchist Mt., Osoyoos (PM); Wilmer, Columbia Valley (Ulke).

Z. gramineus Rydb. Lac la Hache (PM). Close to **Z. venenosus:**—

Upper leaves without sheaths at the base; both sepals and petals distinctly clawed and subcordate at base; gland with a thick, toothed margin ..... *Z. venenosus*

All leaves with distinct sheaths; sepals subsessile; petals long-clawed and subcordate at base; margin of gland ill-defined ..... *Z. gramineus*

IRIDACEAE
IRIS

I. Pseudacorus L. (YELLOW FLAG). Stems 4-9 dm. high from thick rootstocks; flowers bright yellow, short-pedicelled; perianth-segments glabrous and crestless, the outer broadly ovate, 5-8 cm. long, the inner oblong, nearly erect, scarcely longer than the claws of the outer ones. Introduced from Europe Well-established and spreading in ditches at Sardis (R. Glendenning).

SISYRINCHIUM

S. californicum (Ker) Dryand
S. boreale (Bickn) in Henry
Hydastylus californicus (Ker) Salisb.
Widely distributed on V. I. to Cape Scott at the northern tip; outside of V. I. our only record is Lasqueti Is. (DA); not reported as yet from the Mainland.

S. Douglasii A. Dietr.
S. grandiflorum Dougl. (name preoccupied).
Olsynium Douglasii (A. Dietr.) Bickn.
Chiefly on southern V.I. but also at Adams Lake, Kamloops District and Chase (PM). These Interior plants, with filament-tube sharply inflated near the base, belong to the form sometimes separated as *S. inflatum* (Suksd.) St. John.

S. septentrionale Bickn. Windermere, Columbia Valley (PM); Yoho (Ulke).

ORCHIDACEAE
CEPHALANTHERA

Saprophytic perennial herb from a creeping rootstock; whole plant white (turning black in drying). Leaves reduced to scarious sheaths. Flowers in a few-fld. raceme, nearly sessile; lateral sepals spreading, strongly keeled; upper sepal and petals erect and somewhat connivent; lip free, base saccate with broad wing-like margins, articulate in the middle; column long and slender, the stalked anther equalling or overtopping the stigma; pollinia distinct, not connected to a gland.

C. Austinae (Gray) Heller
C. oregona Reichenb.
Eburophyton Austinae Heller
Stem 2-5 dm. high; raceme 5-15 cm. long with 5-20 fls.; sepals and petals oblong-lanceolate, subequal, 10-15 mm. long. B. C. to Calif. and e. to Ida. Agassiz (U); Cultus Lake (U; PM); Chilliwack (DA).

CORALLORHIZA

C. innata R. Br.=**C. trifida** Chatelaine
C. multiflora Nutt. var. *occidentalis* Lindl.=**C. maculata** Raf.
All the sp. given in Henry are widely distributed in the province, **C. trifida** being the least common.

CYPRIPEDIUM

C. passerinum Dougl. Windermere (PM; DA) and Fairmont, Columbia Vy; Field (Ulke).

EPIPACTIS

E. gigantea Dougl.
Serapias gigantea (Dougl.) A. A. Eaton
Cultus L., Chilliwack; Boswell, Kootenay L.; Fairmont, Columbia Valley.

HABENARIA

The following changes are in accordance with D. S. Correll's revision of the western species in Leaflets of Western Botany, 1943.

1. *H. bracteata* (Muhl.) R. Br.=**H. viridis** (L.) R. Br. var. **bracteata** (Muhl.) Gray. Fairmont; more common northwards; 122 mile and Flying U, Cariboo; Colleymount, Francois L.; Ootsa L.

2. **H. obtusata** (Banks) Richards. Fairmont (DA); Chilcotin (PM); Ootsa L. (DA).

5. *H. elegans* (Lindl.) Boland=**H. unalascensis** (Spreng.) Wats. var. **elata** (Jeps.) Correll.

6. *H. Michaelii* Greene is not considered distinct from the last.

7, 11. *H. viridiflora* (Cham.) Rydb. and *H. borealis* Cham.=**H. hyperborea** (L.) R. Br. Kamloops at 3200 ft. (DA); Fairmont (DA); Yoho (DA); Lac la Hache (PM); common in lat. 54.

8. *H. stricta* Lindl. (*H. gracilis* Wats.)=**H. saccata** Greene. Common throughout in the south, less so in the northern Interior.

9, 10. *H. graminifolia* (Rydb.) and *H. leptoceratitis* (Rydb.) are not considered distinct from **H. dilatata** (Pursh) Hook.

12. *H. leucostachys* (Lindl.) S. Wats.=**H. dilatata** var. **leucostachys** (Lindl.) Ames. **H. dilatata** var. **albiflora** (Cham.) Correll with spur only one-half to two-thirds the length of the lip and often clavate, is credited to B. C. by Correll.

H. Chorisiana Cham. The smallest N. Am. sp., seldom exceeding 10 cm. in height; leaves 2, sub-basal; stem without bracts or with a single one (rarely more) about the middle; fls. few; floral segments about 1 mm. long; spur strongly saccate. Known only from Atka in the Aleutians, and Ucluelet, V. I. (J. Macoun).

LIPARIS

Low, scapose from a corm. Leaves 2-6, basal. Flowers greenish, in terminal racemes; sepals narrow, distinct; lateral petals distinct, filiform; lip dilated, often bearing 2 tubercles above the base; column elongated, incurved, margined above; fertile anther solitary, terminal, lid-like; pollinia 2 in each sac, globose, waxy, each pair slightly united, without stalks or glands.

L. Loeselii (L.) L. C. Rich. Corm globose; scape 5-20 cm. high; leaves elliptic or elliptic-lanceolate, 5-12 cm. long, obtuse; lip obovate, pointed, shorter than the sepals; capsule about 1 cm. long, wing-angled on a thick pedicel. An eastern and European sp. "Known in the Pacific States only from Falcon Valley, Wash." (Abrams). 8-mile Creek, Nicola, at 4500 ft., G. V. Copley (PM; G.V.C.).

LISTERA

Our sp. are referred to the genus Ophrys by some botanists.

L. caurina Piper. Also east of the Cascades; Nelson and Crawford Bay, Kootenay Lake (DA); Fairmont, Columbia Valley (DA).

L. nephrophyllum Rydb.=**L. cordata** (L.) R. Br. Our commonest sp.

L. borealis Morong. Stems 6-15 cm. tall; leaves 10-35 mm. long, rather firm, elliptic-ovate, obtuse, borne above the middle of the stem; fls. 2-6, 10-12 mm. long; *lip auricled at the base,* 7-8 mm. long, oblong-cuneate, the lobes at the apex obtuse and *without mucro*; column 3-4 mm. long. Central Alaska, Yukon, Mackenzie, s. to Colo. Yoho (Farr).

MALAXIS

Stem from a corm. Leaves one to few. Flowers in terminal racemes, white or green; sepals distinct, spreading; lateral petals very narrow, often filiform, spreading; lip broad, cordate or auricled at base; fertile anther one,

2-celled, erect between the auricles; pollinia 2 in each sac, waxy, cohering at the summit, stalkless, without glands.

M. monophylla (L.) Sw.

Microstylis monophyllos (L.) Lindl.

Stems glabrous, striate, 10-25 cm. tall; one main leaf, the blade 3-8 cm. long by 1-3 wide, with usually a second leaf that may vary from scale-like to nearly as large as the main one; raceme 2.5-5 cm. long, narrow; sepals and lip about 2 mm. long; lip about 1.5 mm. wide; capsule 4-5 mm. long, 3-4 wide. Circumboreal. Head of Bute Inlet, lat. 51, W. Taylor (DA).

M. paludosa (L.) Sw. Stem scape-like, slender, 3-12 cm. high; leaves 2-5, basal, ovate, obtuse, 6-20 mm. long; sepals lanceolate, spreading; lateral petals much smaller; lip about 3-5 mm. long, 3-nerved, lanceolate, apiculate, shorter than the sepals; capsule 3-4 mm. long. Near Aleza Lake, lat. 54, (U; PM). Known in N. Am. only from four widely separate stations, the others being Thunder Bay, Ont.; Ottertail Co., Minn.; Ketchikan, Alaska. Also in Eurasia. Usually in sphagnum bogs and easily overlooked.

ORCHIS

O. rotundifolia Pursh. Frequent in the Columbia Valley; Yoho; Chilcotin.

PERAMIUM

P. repens (L.) Salisb.

Goodyera repens (L.) R. Br.

Epipactis repens (L.) Crantz.

Common in the Columbia Valley; Yoho; Quesnel; Hazelton.

SALICACEAE

SALIX

S. anglorum Cham. Very close to **S. arctica** Pall. and perhaps not distinct. Differs chiefly in having stomata present on the upper surface of the leaf-blade; petioles usually under 10 mm. long (as against 9-20); pistillate catkins 5 cm. long or less (as against 6-9). Garibaldi (PM); Chilcotin (PM); Yoho (Ulke).

var. **araioclada** Schneid. Differs chiefly in its less pubescent, much more elongate and yellowish twigs; young leaves almost glabrous; catkins on an average longer and thinner and much more loosely fld. towards the base. Chilcotin (PM); Yoho, common at high alt. (Ulke).

S. cascadensis Cockl. A prostrate shrub about 5 cm. high, rooting along the branches; leaves narrowly elliptical to obovate, acute at each end or rarely obtuse at the apex, entire, green and shining above, glabrous when mature, 8-15 mm. long, strongly nerved, the old leaves persistent; catkins 5-20 mm. long, few-fld.; scales brown, villous; capsules sessile, 4-5 mm. long, tomentose; styles 1-1.5 mm. long; stamens 2. B. C. through Wash. to Wyo. Mt. McLean, Lillooet (PM); summit, Mt. Brent, Penticton, alt. 7200 ft. (DA).

S. exigua Nutt. Frequent east of the Cascades, and probably the one described in Henry as **S. argophylla** as he gives "capsule . . . becoming glabrous". The difference appears to be chiefly in the pubescence of the leaves and capsule. **S. argophylla** has young twigs densely white villous-tomentose; leaves densely villous with shining white hairs; capsule densely and permanently villous. Creston Flats (DA).

S. Farrae Ball. Shrub, 3-6 dm. high, branchlets glabrous, bright red, lustrous (often drying dull brown), seasonal twigs yellowish; stipules obsolete or small; petioles slender, twisted; blades elliptic-oblanceolate to elliptic-ovate or broadly oval-lanceolate, acute at apex, acute to (usually) rounded

at base, entire or nearly so, 3.5-5 cm. by 1-1.8, glabrous, glaucous or subglaucous beneath, loosely reticulate with slender raised veins; catkins appearing with the leaves; pistillate 2-4 cm. long in fruit; capsule lanceolate, often acute at base, 4-5 mm. long, glabrous; pedicel 1-1.5 mm. long; style 0.3-0.5 mm. long; stigmas short; scales oblong or oblanceolate, obtuse, fuscous at apex, paler below, glabrous outside. Rocky Mts. of B. C. and Alta. to Mont. and Ore. Type from Field; Burgess Trail, Yoho (Ulke); Elk R. Vy (Pullman).

S. myrtillifolia Anderss. Close to **S. pseudomyrsinites** but only 1-6 dm. high and leaves obtuse or rounded at apex and crenate, as against acute to acuminate and more or less serrate. Green L.; Cariboo (DA).

S. pseudocordata (Anderss.) Rydb. A tall shrub; twigs yellowish or rarely purplish; leaves oval-oblong or oblong-lanceolate, acute or short-acuminate at apex, rounded or rarely subcordate at base, thick, firm, green and shining above, glaucous beneath, finely serrate, 4-8 cm. long; catkins 3-4 cm. long, subsessile; scales black, white-pilose; filaments glabrous; capsule lance-ovoid, long-beaked; stipe very short; style 1-1.5 mm. long. Paradise Mine, Windermere (PM).

S. pseudomonticola Ball. Shrub, 1-4 dm. high; branchlets yellowish to red or brown, shining, usually glabrous; stipules large; blades elliptic-ovate or narrowly to broadly ovate (obovate when young), 4-6 cm. long by 1.5-3 wide, rounded to (mostly) cordate at base, acute to abruptly acuminate at apex, coarsely glandular crenate-serrate, green above, glaucous beneath, glabrous and strongly veined on both surfaces; catkins appearing with the leaves, subsessile, pistillate 3-7 cm. long; scales broadly oblanceolate, obtuse, brown, clothed densely within and thinly outside with long hairs; capsules 6-8 mm. long, glabrous; pedicels 1-1.5 mm. long; style 0.6-1 mm. long; stamens 2, filaments glabrous, free. Rocky Mt. region of B. C. and Alta. to Nev. and Wyo. Nicola (DA); Flying U, Cariboo (DA).

MYRICACEAE
MYRICA

M. californica C&S. Differs from **M. gale** in being evergreen, monoecious, and often a tree (reaches 50 ft. under favorable conditions); leaves 5-10 cm. long, glabrous, thick, oblong to oblanceolate, acute at apex, narrowed at base to a short petiole, remotely serrate to nearly entire; staminate catkins borne below the pistillate, 12-16 mm. long; stamens 7-16, united by their filaments; pistillate catkins in axils of upper leaves, 8-12 mm. long; fruit brownish purple, 6-8 mm. in diam., with a whitish waxy bloom. Coastal region, V. I. to Calif. Ucluelet (PM); Tofino (U; PM).

BETULACEAE
BETULA

M. L. Fernald (Rhodora **47**. 1945) concludes that the name **B. occidentalis** Hook. rightly belongs to the sp. known in recent years as *B. fontinalis* Sarg. He refers the *"B. occidentalis* Hook." of the Pacific Slope to **B. papyrifera** Marsh var. **commutata** (Regel) Fern., a form also occurring in eastern N. Am.

B. pumila L. var. **glandulifera** Regel.
B. Hallii Howell.
Included in **B. glandulosa** in Henry, but differs in being usually taller, 1-4 m., the twigs only slightly glandular and clothed with long, scattered hairs when young instead of glabrous; near Victoria (PM).

CORYLUS

C. cornuta Marsh.
C. rostrata Ait. Hazelton (PM), lat. 55; McBride (DA), lat. 53.

URTICACEAE
URTICA

U. urens L. Not common; Chinese gardens on Musqueam Reserve, Vancouver (DA); Chase (PM).

SANTALACEAE
COMANDRA

C. umbellata (L.) Nutt.
C. Richardsiana Fern. Widely distributed; Elk L., V. I.; Kamloops; Nicola; Penticton; Canal Flats, Columbia Vy.

LORANTHACEAE
ARCEUTHOBIUM

A. Douglasii Engelm. is the sp. on Douglas Fir, and does not seem to be recorded from B. C. The form on *Tsuga*, which does occur, is usually made a var. of this, var. **tsugensis** M. E. Jones. The form on *Larix occidentalis* is **A. laricis** (Piper) St. John (*A. Douglasii* var. *laricis* M. E. Jones); Crawford Bay, Kootenay L. (DA).

POLYGONACEAE
ERIOGONUM

E. flavum Nutt. Frequent in the Upper Kootenay R. valley; Wasa, Skookumchuck, Fort Steele, etc.
E. ochroleucum Small. Paradise Mine, Windermere, at 8000 ft. (U); near Elko (Pullman).
E. ovalifolium Nutt. near Summerland (U).

POLYGONUM

7. **P. Engelmannii** Greene. Abundant at Field (Ulke).
15. **P. viviparum** L. Black Tusk Meadows, Garibaldi (DA); Monashee Pass (DA); Fairmont, Columbia Valley (DA).
16. **P. bistortoides** Pursh. Liumshan Mt., Chilliwack (PM).
23. **P. punctatum** Ell. (*P. acre* HBK). Not common; Penticton (DA).
25. **P. hydropiperoides** Michx. Not common; Sumas (DA); near Leanchoil, Yoho (Ulke).
P. Douglasii Greene var. *montanum* Small=var. **latifolium** (Englem.) Greene.

Additional Species

The first six all belong to the section **Avicularia** with flowers in small clusters, rarely solitary, in the leaf-axils.

P. achoreum Blake. Annual; stem ascending, branched, 15-40 cm. long, striate, glabrous; ochreae scarious, whitish with a brown base, soon lacerate, 4-9 mm. long; leaves crowded, elliptic, oval, or obovate, rounded at apex, 7-22 mm. long by 4-10 wide, bluish-green; perianth bluish-green, in fruit 3.5-4 mm. long, the outer lobes with or without a narrow pale margin, the inner white- or pink-margined; achene included, dull, obscurely punctate, 2.5 mm. long. Alaska to Que., s. to Mont. and Mo. Roadsides and waste places; widely distributed in the Interior; common in lat. 54.

P. buxiforme Small. Annual or perennial; stems usually prostrate, 2-12 dm. long; leaves oblong, elliptic, or oblanceolate, 0.5-2.5 cm. long, usually obtuse, often crisp on the margin; perianth 2-2.5 mm long; achene 2-2.5 mm. long. Differs from **P. aviculare** in the restricted sense, in the thicker, more prominently veined leaves, more obtuse at the apex; conspicuous ochreae, and achenes granular, not striate. Alaska to Ont., s. to Nev. and Tex. Victoria (Macoun); Osoyoos (DA); Choelquoit L., Chilcotin (DA).

P. majus (Meisn.) Piper. Annual; stems erect, 15-35 cm. high, usually much branched, slender, wiry, inconspicuously striate; leaves linear-lanceolate, 2-6 cm. long, ochreae 15-20 mm. long; fls. remote on elongated spikes, subtended by short subulate bracts; calyx 4-5 mm. long, white with green midvein; styles 3-cleft to middle; achene reflexed, 3-3.5 mm. long, acuminate, black, smooth, shining. Wash. and Ore., east of the Cascades to Ida. Lytton (PM).

P. neglectum Besser.

P. aviculare var. *angustissimum* Meisn.

Differs from **P. aviculare** in the shorter perianth (2-2.5 mm. long), smaller achenes (2-2.5 mm.), acuminate at the tip, and leaves mostly less than 2 cm. long; from **P. buxiforme** in having the leaves thin, not prominently veined; ochreae inconspicuous, and face of achene striate. Introduced from Europe. Sea Is. (DA); Lulu Is. (DA); both near Vancouver.

P. prolificum (Small) Robinson. Close to **P. neglectum,** differing in being more branched; leaves linear or nearly so; upper leaves more scattered and reduced; achene granular with concave faces. Yukon to Que. and s. to Va. and Colo. Douglas Lake (PM).

P. rubescens Small. Stems erect, branched from below, 1-5 dm. high; leaves thick, narrowly oblong or elliptic, 10-25 mm. long, the upper ones scattered and reduced; perianth 3 mm. long; achene 2-2.5 mm. long, dull, striate. Sask. to Ida., s. to Nev. and Colo. Victoria; Golden (DA); Creston (DA).

P. Kelloggii Greene. Annual; glabrous throughout; stems mostly erect, simple or branched from the base, 3-8 cm. high; leaves linear, few below the infl., 15-30 mm. long; infl. crowded resembling a terminal spike; perianth white or rose-colored, 1-1.5 mm. long; stamens with anthers 3; achene 1-1.5 mm. long, brown, dull and smooth or granular towards the apex. B. C. to Calif., e. to Colo. Botanie, Lytton, at 4500 ft., F. Perry (DA).

P. unifolium Small. Annual; stem 1-3 cm. high, simple, with mostly a single linear leaf, 7-10 mm. long; bracts several, crowded, imbricate, linear to linear-lanceolate; perianth about 1.5 mm. long, white or pinkish, with green midrib; achene about 1.3 mm. long, included, shining. Mont. to Utah. Edge of dried up snow pools at 6000 ft., Toad Mt., Nelson (DA).

RUMEX

R. mexicanus Meisn. Peck keeps this name; Abrams gives *R. salicifolius* Weinm; other writers *R. triangulivalvis* (Danser) Rech. f. Smithers, lat. 54.

R. acetosa L. A garden escape at Yarrow and Nelson, but common and apparently native in lat. 53-54.

R. paucifolius Nutt. Ootsa Lake, lat. 54. (PM).

CHENOPODIACEAE
ATRIPLEX

A. argentea Nutt. Specimens in DA from Tranquille; Nicola; Windermere, Columbia Valley; Alexis Creek, Chilcotin, lat. 52.

A. patula L.

var **hastata** (L) Gray is a weed of cult. land in the Okanagan.

var. **obtusata** (Cham.) Peck.

A. Gmelini C. A. Meyer.

Leaves linear, oblong or narrowly lanceolate; fruiting bracts with entire margins and the faces nearly smooth (not tuberculate). Alaska to Calif.

A. hortensis L. (Garden Orache). A tall nearly glabrous annual, 5-20 dm. high; leaves ovate to oblong-lanceolate, truncate, cordate or subhastate at base, entire to sinuate-toothed, obtuse, 4-12 cm. long; fls. monoecious, in

a more or less spike-like panicle, the two kinds mixed; staminate perianth 3-5-lobed, pistillate usually wanting; fruiting bracts strongly compressed, short-petioled, united below, ovate to nearly orbicular, 8-18 mm. long, entire or slightly denticulate, becoming reticulate in age. An Old World sp. apparently established along the highway between Ashcroft and Kamloops; most plants are the red-leaved form commonly cultivated as an ornamental.

A. rosea L. (TALL SALTBRUSH). Annual, 1-20 dm. tall, branched from the base; leaves whitish, 2-6 cm. long, sessile or petioled, ovate or rhombic-ovate to lanceolate, cuneate or rounded at base, remotely dentate; fls. monoecious; staminate glomerules in upper axils or dense terminal spikes, the perianth 4-5-lobed; pistillate without perianth; bracts 4-6 mm. long, broadest below the middle, acute, rhombic or ovate, indurate, united to the middle, margins greenish, dentate, the backs tubercled. Introduced from Europe and now common in the Dry Belt, especially in the southern Okanagan.

A. truncata (Torr.) A. Gray. (WEDGESCALE). Resembling **A. argentea** but stricter, the branches less widely spreading; upper leaves sessile and often cordate-clasping; fruiting bracts only 2-3 mm. long (as against 4-8), truncate, toothed only at the apex. B. C. to Calif., e. to Mont. and N. Mex. Apparently much less common than **A. argentea**; Kamloops (DA).

AXYRIS

Annual herbs with alternate, entire, petiolate leaves, and small monoecious fls., the pistillate one pilose or villous, the staminate uppermost, very small; perianth of staminate ones 3-5-parted, stamens 2; of pistillate 3-4-parted, ovary suborbicular, somewhat flattened, stigmas 2, filiform, connate at base; utricle obovate to cuneate, winged or crested at apex, enclosed in the perianth; seed erect; embryo horse-shoe shaped; endosperm copious.

A. amarantoides L. (RUSSIAN PIGWEED). Erect, often much branched, the branches ascending, 3-12 dm. high; pubescent; leaves ovate, elliptic to lanceolate, entire, acute or obtusish, narrowed at the base, thin, 3.5-7.5 cm. long, petioles slender, 6-14 mm. long; staminate fls. glomerate-spicate; fruit oval or obovate, more or less winged at the top, flattened. A Siberian plant, established on the Prairies since 1886, and now becoming common in the Cariboo and Chilcotin; Fort St. James, lat. 54½ (DA).

BASSIA

Herbs with narrow entire leaves. Spikes leafy-bracted, the flowers solitary in the axils, perfect; calyx-segments each ending in a hooked spine; utricle depressed, with a transverse wing.

B. hyssopifolia (Pall.) Ktze. Annual; stem 6-12 dm. high, erect, freely branched from the base, finely tomentose or villous throughout; leaves narrowly oblanceolate, entire, 1-2 cm. long; spikes numerous, leafy-bracted; fls. mostly solitary in the axils of the bracts, about 1 mm. broad; calyx white-villous or tomentose, 5-lobed. Introduced from Asia; first collected in B. C. in 1920 (PM), but now abundant in the Dry Belt. The young plants are grazed by stock.

CHENOPODIUM

C. Botrys L. Becoming frequent; Garibaldi; Alta Lake; Hedley; Okanagan Falls; Osoyoos; Grand Forks; Alkali Lake; Pemberton; in DA.

C. glaucum L. Abundant around Cranbrook Slough; Edgewater, Columbia Valley; Lac la Hache; Alexis Creek, Chilcotin.

C. humile Hook. Kaleden (DA); Vasseux Lake (DA); both in s. Okanagan.

C. hybridum L. Some recent authors consider the American form distinct and name it *C. gigantospermum* Aellen.

C. leptophyllum Nutt. Penticton (DA); Osoyoos (DA); Redstone, Chilcotin (DA).

CORISPERMUM

C. hyssopifolium L. Not common; Redstone, Chilcotin (DA); Invermere, Columbia Valley (H. Groh).

C. nitidum Kit. Differs from **C. hyssopifolium** in the smaller fruit (2-3 mm. long as against 3-4.5) and the lower bracts narrower than the fruit. Lytton (PM).

C. villosum Rydb. Perhaps not distinct from **C. hyssopifolium;** whole plant more or less villous; fruit 2.5-3 mm. long, acute-margined but scarcely winged. Deadman's Creek, Savona (PM); Merritt (G.V.C.).

KOCHIA

Herbs or low shrubs with alternate or opposite, narrow, entire leaves. Flowers perfect or pistillate, axillary, solitary or clustered; calyx 5-lobed, the lobes incurved, in age developing a scarious horizontal wing; stamens 5, exserted; stigmas 2-3; utricle depressed-globose, the pericarp free from the horizontal seed.

K. scoparia Schrad. var. **trichophylla** (Schinz. & Thell.) Bail. (SUMMER CYPRESS). Annual, much branched, the branches erect, forming a dense, ovoid, bushy plant, turning purple-red in autumn; leaves linear, 1-5 cm. long, with long silky hairs. A garden ornamental, well established in orchards, roadsides and waste places around Penticton.

MONOLEPIS

M. Nuttalliana (R&S) Greene. Kamloops; Cranbrook; Fairmont; Windermere; Williams Lake; Chilcotin.

SARCOBATUS

It is doubtful if *S. vermiculatus* (Hook) Torr. occurs in our territory. The so-called "Grease-wood" of the Southern Interior is **Purshia tridentata** (Pursh) DC.

SUAEDA

S. depressa var. **erecta** S. Wats. also occurs. Differs from the sp. in being erect, strict, simple, or sparingly branched above. Kamloops (DB).

ILLECEBRACEAE

Small diffusely branched herbs. Leaves usually opposite and entire with scarious stipules (wanting in *Scleranthus*). Flowers small and inconspicuous, cymose; calyx 4-5-lobed or parted; petals 0; stamens 1-10 (usually 4-5), hypogynous or perigynous; pistil 1; ovary superior, 1-celled; styles 2, more or less united. Fruit an achene or utricle enclosed in the calyx-tube.

SCLERANTHUS

Inconspicuous annuals with repeatedly forked branches. Leaves opposite, subulate, connate at the base, without stipules. Flowers minute, greenish, clustered, sessile; stamens 1-10, inserted on the calyx. Utricle included in the indurated calyx-tube.

S. annuus L. (KNAWEL). Low annual, the branches prostrate to spreading, 5-15 cm. long; leaves subulate, scarious-dilated at the base, 5-20 mm. long; fruiting calyx about 4 mm. long, 10-angled, lobes about equalling the tube, acute. Introduced from Europe; an orchard weed at Crawford Bay, Kootenay Lake (DA); Agassiz (H. Groh).

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AIZOACEAE

Annual or perennial herbs, often succulent, with whorled, opposite, or rarely alternate leaves. Stipules absent or scarious. Flowers solitary or clustered in the axils, regular and perfect; calyx 4-5-parted or lobed, tube free or adnate to the ovary; petals 0 or many and linear; stamens 3 to many, hypogynous or perigynous; styles 3-20; ovary 3-20-celled. Fruit a dry or somewhat fleshy capsule, or nut-like and indehiscent.

MOLLUGO

Low annuals, mostly with whorled leaves. Flowers small, axillary or cymose; calyx-segments 5, persistent, scarious-margined; petals 0; stamens mostly 3-5, hypogynous; ovary 3-celled. Fruit a 3-valved, many-seeded, loculicidal capsule.

M. verticillata L. (CARPET-WEED). Glabrous throughout; stems dichotomously branched, 10-20 cm. long, prostrate, not succulent; leaves 5-6 in a whorl, 10-25 mm. long, spatulate to narrowly oblanceolate, obtuse, entire, narrowed to a short petiole; fls. axillary on filiform pedicels; sepals 1.5-2 mm. long, oblong; stamens usually 3; capsule slightly longer than the sepals. Native of tropical Am. but widely introduced in N. Am. Agassiz, Mission and Sicamous, H. Groh (DB).

PORTULACACEAE

CLAYTONIA

(Montia)

C. asarifolia Gray=**C. cordifolia** S. Wats.

C. sibirica L. occurs in the Kootenay Lake region and probably elsewhere in the Interior as its range is given as extending eastwards to Montana.

C. sarmentosa C. A. Meyer. Calvert Is., Rivers Inlet, lat 51 (PM).

C. diffusa Nutt. A thin-leaved annual, 5-20 cm. high, diffusely much-branched from the base, leafy; leaves alternate, blades ovate to deltoid, 15-35 mm. long on petioles as long or longer; infl. terminal, paniculate, bracteate below, 4-8-fld.; sepals 2-3 mm. long; petals white or pink, emarginate, 3-5 mm. long; stamens 5; capsule obovate, equalling the calyx or a little longer; seeds 1-3, black, 1-1.5 mm. long with a faint regular reticulation. Wash. to Calif. Alberni, V. I. (U); Cameron L., V. I. (PM Cat.).

TALINUM

T. okanoganense English.

T. Wayae Eastw.

Perennial from a thickened root, with spreading tufted branches, 2-5 cm. long; leaves grey-green, terete, 4-12 mm. long; infl. of 2-9-fld. bracteate corymbs; petals white, tinged with pink or yellow, 7-8 mm. long; sepals ovate, mucronate, 4 mm. long; stamens about 20; capsule ovoid, 2-3 mm. long; seeds many, black, shining. Differs from **T. spinescens** in the absence of the spiny midribs of the old leaves on the caudex and the short infl., 2.5-3.5 cm. as against 10-25 cm. Hillsides near Kamloops (DA; PM); otherwise known only from Okanogan Co., Wash.

CARYOPHYLLACEAE

ARENARIA

A. capillaris of Am. authors=**A. formosa** Fisch. as to our common form. According to St John, *A. glaucescens* (Wats.) Piper is the same thing. *A. nardifolia* Ledeb., if it occurs in N. Am., is probably a sp. of Yukon and the far north.

A. sajanensis Willd. is now considered to be a sp. of the eastern arctic only, in N. Am, our related form being **A. obtusiloba** (Rydb.) Fern.

According to Fernald, true **A. verna** L. is very rare in America, but he gives Mt. Arrowsmith, V. I. as one record.

var. *propinqua* (Richards.) Fern. (*A. propinqua Richards*), glandular-pubescent, with fl. branches up to 15 cm. long and 2-5-fld.; calyx 2.5-3.5 mm. long; is our common form.

var. *rubella* (Wahl.) Wats., glabrous or nearly so, branches shorter and 1-rarely 2-) fld., calyx 3-4 mm. long in fruit; also occurs. These two vars. together with var. *hirta* (Wormskj.) Wats. are combined by recent authors under **A. rubella** (Wahl.) Sm.

CERASTIUM

C. Beeringianum C&S. Mt. McLean, Lillooet (PM); Chilcotin (PM).
C. semidecandrum L. Nanaimo (DA); Locarno Park, Vancouver (DA).

GYPSOPHILA

Annual or perennial, branching or diffuse, mostly glabrous and glaucous herbs. Leaves narrow. Flowers perfect, axillary or panicled; calyx narrowly turbinate or campanulate, bractless, 5-nerved, 5-toothed; petals 5 with narrow claws; stamens 10; styles 2. Capsule dehiscing by 4 valves.

G. paniculata L. (Baby's Breath). Perennial; stems 3-9 dm. high, bushy-branched, glabrous, or pubescent below; leaves 15-30 mm. long, connate, linear-lanceolate, mostly 3-nerved; panicle very large and diffuse; pedicels 3-10 mm. long; calyx 2 mm. long, 5-lobed; petals 4-6 mm. long, white. A garden ornamental, abundantly established on the hillsides around Creston. The whole plant finally breaks off at the ground level and becomes a "tumble-weed", scattering the seeds as it is rolled along by the wind.

HOLOSTEUM

Low annual herbs. Flowers cymose-umbellate on long terminal peduncles; sepals and petals 5, the latter emarginate or erose; stamens 3-5; styles 3; capsule ovoid-cylindric, dehiscing by 6 short teeth. Differs from *Cerastium* chiefly in the petals not being 2-cleft.

H. umbellatum L. Tufted, 8-25 cm. high, branches mostly simple, glandular-pubescent above, sparsely tomentose below; basal leaves lanceolate, cauline oblong to narrowly ovate, sessile, 1-2 cm. long; umbels 3-8-fld.; pedicels slender, 15-25 mm. long, reflexed in fruit; sepals obtuse, 4 mm. long, scarious-margined; petals erose, slightly longer than the sepals; capsules ovoid to oblong, about 8 mm. long, teeth recurved. Introduced from Europe. Saanichton, V. I. (DA; PM).

LYCHNIS

L. alba Mill.

L. vespertina Sibth. (White Cockle; White Campion)

Biennial or short-lived perennial; glandular-pubescent throughout; usually dioecious; stems erect, branched, 3-6 dm. high; leaves lanceolate to ovate-oblong, 3-7 cm. long, the lower narrowed to a petiole, the upper sessile; fls. in an open panicle, night-flowering; calyx-tube tubular, distended in fruit, 10-12 mm. long, the teeth lanceolate-subulate, 5-6 mm. long; petals white, blades obovate, about 10 mm. long, 2-cleft; capsule ovoid-conical, narrow-mouthed at dehiscence. Introduced from Europe; occasional throughout the province, but not yet a serious weed.

L. dioica L.

L. diurna Sibth. (Red Campion)

Much like the last but petals usually red; flowers opening during the day; calyx-teeth triangular-lanceolate, acute; capsule globose, the mouth

wide at dehiscence. Introduced from Europe; Vancouver (DA), mostly a casual garden escape, but apparently well-established in Stanley Park.

L. furcata (Raf.) Fern.

L. affinis Am. auct.

Melandrium furcatum (Raf.) Hult. Lake McArthur, Yoho (Farr).

Close to **L. apetala** L.

Stems solitary or few; calyx 12-15 mm. long, much inflated; petals purplish; seeds 1.8-2.4 mm. wide, with a nearly circular wing.....*L. apetala*

Stems tufted; calyx 8-12 mm. long, less inflated; petals white; seeds 1-1.5 mm. wide with irregular wing.....*L. furcata*

SAGINA

S. procumbens L. Annual or perennial, branching from the base, glabrous, 3-8 cm. high, forming dense mats; leaves narrowly linear, 2-6 mm. long; peduncles capillary, well exceeding the leaves; sepals 4, rarely 5, oblong-ovate, obtuse; petals shorter than the sepals or absent; stamens 4-5; capsules scarcely exceeding the calyx, often nodding in fruit; seeds finely reticulate but not roughened. Native of Eurasia. A pest of lawns and rock-gardens at the Coast, more recently in West Kootenay, and probably elsewhere.

SILENE

S. latifolia (Mill.) Britt. & Rend. and **S. noctiflora** L. are becoming frequent weeds throughout, especially the latter.

S. Cserei Baumg. Annual; stems one to several, leafy, 2-9 dm. high, glabrous; leaves ovate to elliptic-lanceolate, thick, glaucous, sessile; infl. elongate; fls. very numerous, fascicled; calyx ovoid, slightly inflated, glabrous; petals white, blade 2-cleft. Europe and Asia Minor. Abundant in railway yards, Prince George (DA). Resembles **S. latifolia** but with a straight tap-root; infl. longer; fls. more numerous (up to 130 on a stem in our plants); calyx smaller and less inflated.

S. dichotoma Ehrh. (Forked Catchfly). Annual, erect, branching, pubescent, 3-6 dm. high; lower leaves lanceolate to oblanceolate, 5-7.5 cm. long; infl. of dichotomously branched, one-sided racemes with a fl. in each fork, and others solitary or in pairs along the axis; fls. sessile or short-pedicelled; calyx cylindric, 10-ribbed, hirsute; petals white or yellowish. Introduced from Europe. Established at Bonnington for some years and now frequent from Robson to Kaslo in neglected orchards, waste places and roadsides.

SPERGULARIA

S. canadensis (Pers.) G. Don. The form occurring on the Pacific Coast s. of Alaska has been distinguished as var. **occidentalis** Rossbach. Differs from the sp. in its more erect habit; often more glandular-pubescent; stipules usually somewhat larger; capsule not so much exceeding the calyx.

S. diandra (Guss.) Boiss. A slender, diffuse or prostrate, divaricately branched annual, usually glandular-puberulent throughout; stems 4-10 cm. high, weak; leaves narrowly linear, 5-20 mm. long; stipules small; fls. in open leafy-bracted cymes; pedicels 3-10 mm. long, often reflexed after flowering; sepals 2-4 mm. long, obtuse; petals pink, shorter than the sepals; capsule a little longer than the calyx; seeds dark brown to black, pyriform, 0.4-0.5 mm. long, smooth or faintly reticulate. Wash. and Ida. to Calif. Kamloops (DA).

S. macrotheca (Hornem.) Heynh. Perennial from a stout fleshy root; more or less glandular-pubescent throughout, the stems stout, ascending 1-4 dm. high, branching from the base; leaves linear, 15-40 mm. long; stipules triangular-ovate, acuminate; cymes terminal, their branches often racemose;

pedicels about 15 mm. long; sepals 5-10 mm. long, broadly scarious-margined; petals pink, mostly shorter than the calyx; capsule nearly equalling the calyx; seeds dark brown, winged or not, the sides smooth. V. I. to Calif. along the coast; common around Victoria.

S. marina (L.) Griseb. Occurs also in the Interior; Kamloops (Rossbach).

NYMPHAEACEAE
BRASENIA

B. Schreberi Gmel. PM Cat. gives also Victoria; Alberni, V. I.; Texada Is.

NUPHAR

Nymphaea as defined by Henry=**Nuphar** of many authorities.

Nuphar polysepala Engelm.

Nymphaea polysepala (Engelm.) Greene.

Nymphozanthus polysepalus (Engelm.) Fern. Our common species.

N. variegata Engelm. Newf. to B. C., s. to N. J., Pa., O., and Mont. (Deam). Along the Cariboo Road (Pullman).

Close to the last. Rydberg gives the following separation:—

Sepals 9-12; fls. 6-10 cm. wide; stamens red.....*N. polysepala.*

Sepals usually 6; fls. 4-7 cm. wide; stamens yellow.....*N. variegata.*

NYMPHAEA
(*Castalia*)

Differs from *Nuphar* in the large petals, both petals and stamens inserted on the ovary instead of below it.

N. tetragona Georgi subsp. **Leibergi** (Morong) Porsild. Leaves floating oval or oblong, 5-10 cm. long, 3-7.5 wide; sinus open, narrow; fls. inodorous, 2-5.5 cm. across; petals in about 2 rows, white, faintly striped with purple, oblong or obovate, acutish or obtuse, thin, about as long as the sepals. Rare, but widely distributed in northern N. Am. Spider Is., lat. 51 (PM); Aleza L. (PM) and Hansard L. (DA), both lat. 54.

CERATOPHYLLACEAE

Submerged aquatic herbs with whorled dissected leaves. Flowers monoecious, inconspicuous, sessile in the axils, with an 8-12-cleft involucre; perianth wanting; stamens many, hypogynous, filaments very short; pistil 1; fruit a nutlet with persistent style.

CERATOPHYLLUM

The only genus. Characters those of the family.

C. demersum L. Hornwort. Stem varying in length with the depth of the water, up to 3 m.; leaves 5-12 in a whorl, dichotomously 2-3 times forked into filiform or linear segments; fruit oval, 4-6 mm. long, tubercled, winged or spurred below. Widely distributed both in N. Am. and the Old World. Comox, V. I. (Macoun); Osoyoos L. (DA); Pemberton (DA); 130 mile, Cariboo Road (PM); Prince George (DA).

RANUNCULACEAE
ACONITUM

A. columbianum Nutt. Abundant in the mts. around Kootenay Lake at alt. 4000-6000 ft.

A. delphinifolium DC. Root tuberous; stem erect, 3-7 dm. high, finely pubescent or glabrate; leaf-blades pentagonal in outline, glabrous, deeply divided to the base and again cleft; infl. few-fld.; hood boat-shaped, only

slightly saccate, almost semicircular in outline, 2-2.5 cm. long, beak very short; lateral sepals broadly rounded-ovate, a little longer and about 3 times as broad as the oblong lower one. Alaska-Alta.-B. C. Q. C. I. (PM Cat.); Hazelton (PM), lat. 55¼.

ACTÆA

A. eburnea Rydb. is probably only a white-fruited form of **A. arguta** Nutt.

ANEMONE

A. multifida=**A. globosa** Nutt.

A. Drummondii Wats. Mts. near Hope (DA).

A. cylindrica A. Gray. Stem 3-6 dm. high, 1-10-fld; leaf-blades 3-8 cm. wide, 3-5-parted; divisions wedge-lanceolate, 3-cleft and again cleft or toothed, with ovate or lanceolate teeth or lobes; involucral ones similar; infl. subumbellate; sepals greenish-white, oblong, 8-10 mm. long; heads cylindric in fruit, 2-4 cm. long by about 1 cm. thick; styles about 1 mm. long. N. B.-N. J.-Ariz.-B. C. (Rydberg.) Quesnel (DA).

A. virginiana L. Resembling the last but 6-10 dm. high; leaf-blades broader; divisions ovate-lanceolate; infl. cymose; heads in fruit ovoid or thick-cylindric, less than twice as long as broad; styles about 2 mm. long, divergent. N. S. to Alta., s. to Kans. and Wyo. Prince George (PM); Prince Rupert (DB).

COPTIS

C. asplenifolia Salisb. Common on Hollyburn Ridge, West Vancouver, often flowering among snow patches.

DELPHINIUM

D. scopulorum Gray var. **glaucum** (Wats.) Gray.

D. glaucum Wats.

D. Brownii Rydb.

The common sp. in lat. 53-54; very abundant from Vanderhoof to Smithers and south to Ootsa Lake; reaches a height of 18 dm. or more; one of the commonest causes of stock-poisoning in these districts.

D. depauperatum Nutt. Close to **D. Menziesii.** Meadows above Field (Ulke).

Follicles 15-20 mm. long, often arcuate-diverging; seeds with incurved wings at the summit, the lateral angles not winged or only slightly so above ..... *D. Menziesii*

Follicles 8-14 mm. long, only the tips diverging; seeds conspicuously white-winged on the lateral angles as well as the summit. *D. depauperatum*

MYOSURUS

M. aristatus Benth. Mature achenes sharply keeled on the back and with prominent aristate beaks about as long as the body and more or less recurved-spreading. "This sp. has been referred by some botanists to *M. apetalus* Gay. of Chile." (Abrams).

M. minimus L.

M. major Greene.

Mature achenes with beaks very short and closely appressed; back of achene flat or depressed without lateral ridges, quadrate or rhomboidal. Saanich, V. I. (PM).

var. **lepturus** (Gray) Howell. Back of achenes narrowly oblong and narrowed at both ends, more or less distinctly nerved towards the margins and grooved between them and the rather flattened keel. Nicola (PM).

RANUNCULUS

R. abortivus L. Uncommon; Naksup (DA); Crawford Bay (DA); Prince George (DA).

R. Suksdorfii A. Gray. Burgess Pass, Yoho (Ulke).

R. sceleratus L. Chiefly in the Interior, but recorded from the Coast at Bare Is. (PM Cat.) and Sea Is., Vancouver (DA).

R. orthorhyncus Hook. Generally distributed on V. I.

var. **platyphyllus** A. Gray. General on V. I.; Bella Coola (PM); road to Silver King Mine, Nelson, at about 5000 ft. (DA).

R. aquatilis L.

var. **capillaceus** (Thuill.) DC.

var. *trichophyllus* (Chaix) Gray. Leaves all submerged; petals 4-8 mm. long; achenes about 1.5 mm. long.

var. **hispidulus** E. Drew.

R. Grayanus Freyn.

R. trichophyllus var. *hispidulus* W. Drew.

Floating leaves present, reniform, 1-3 cm. broad by 5-10 mm. long, 3-lobed or -parted, the lobes again parted, sometimes hispidulous dorsally. Both these vars. range from Alaska to Calif.

R. Cooleyae Vasey & Rose. Glabrous perennial, caudex 1 cm. long; scapes simple, 3 dm. long, bearing a single scale-leaf; basal leaves reniform, 3-lobed, the lateral ones dichotomously shallowly parted and lobed; sepals 5, yellow, petaloid, 7-9 mm. long by 5 wide, glabrous; petals 7-16, yellow, 7-8 mm. long by 2 wide, the claw 4 mm. long, narrow, margin rolled ventrally into the forked nectary scale; achenes 25-30, 2.5 mm. long by 1 broad, 3-striate on each face, beak 1.3 mm. long, hooked at tip; receptacle broad and convex in fruit. Slopes near snow, Alaska to the mts. of western B. C. and the Olympics, Wash. (Abrams).

R. verecundus Robinson. Glabrous perennial, stem 8-20 cm. long, mostly unbranched, slender; basal leaves cordate or reniform, 7-12 mm. long by 9-18 mm. wide, 3-parted, the middle lobe again 3-lobed, the lateral 3-5-lobed, lobes obtuse; cauline leaves 1-3; petals 5, yellow, rather narrow, 3-5 mm. long; achenes in a cylindrical head 5-8 mm. long, obovate, 1-5 mm. long, smooth and glabrous, beak half as long as the body, distinctly recurved at the tip; receptacle elongated in fruit, glabrous. High alpine, Alaska to Wash. and Ida. Paradise Mine, Windermere, at 7500 ft. (PM).

THALICTRUM

T. dasycarpum Fisch. & Lall. Much like **T. venulosum** but larger in all its parts, reaching a height of 21 dm.; *leaflets ovate to oblong, up to 5 cm. long, thinly puberulent beneath;* infl. 3-4 dm. long; achene with 6-8 narrow wings. Ont. to Sask. and south. Abundant, especially at edge of woodlands, Reclamation Area, Creston (DA).

FUMARIACEAE

CORYDALIS

C. Scouleri Hook. Glabrous and glaucous; stems stout, up to 12 dm. high, from tuberous roots; leaves 3-ternate or the third division pinnate, leaflets oblong to oblong-elliptic, 2-3 cm. long, usually obtuse; racemes narrow, rather loose; fls. pink; spur 2-3 times as long as rest of fl., stout, ascending, straight, 12-15 mm. long, its hood with a prominent dorsal crest; capsule elliptic, pendulous, 8-10 mm. long. Coastal region of Wash. and Ore. Nitinat River, V. I. (PM).

DICENTRA

D. uniflora Kell. Armstrong (U; DA); Phoenix (PM).

FUMARIA

Erect, ascending, or climbing plants with delicate dissected leaves; racemes long, narrow, many-flowered; sepals 2, scale-like; petals 4, the outer pair larger and one of them spurred at the base, the inner narrower and adherent at the tips, keeled or crested on the back; stamens 6, diadelphous, opposite the outer petals; fruit globose, indehiscent, 1-seeded.

F. officinalis L. A glabrous and glaucous diffusely branched annual; 2-10 dm. high; leaves petioled, finely dissected into narrow, linear or cuneate segments; racemes 25-75 mm. long; pedicels 2-4 mm. long; fls. purplish, much darker at the tip, 4-6 mm. long; nutlet 2 mm. in diam. Introduced from Europe. White Rock (DA).

CRUCIFERAE

ALYSSUM

A. alyssoides L. Merritt (DA); Lumby (DA); Cranbrook (PM).

ARABIDOPSIS

Annual or perennial herbs with erect slender stems, pubescent with forked hairs. Leaves simple, entire or toothed. Flowers small, white or pink, in terminal racemes; style very short; stigma 2-lobed; pod terete, valves rounded, faintly nerved or nerveless; seeds in one row in each cell. Differs from *Sisymbrium*, with which it is often included, chiefly in the pubescence being of forked instead of simple hairs.

A. Thalianum (L) Rydb.

Sisymbrium Thalianum (L) Gay. Saanichton, V. I. (DA); Vancouver (DA); Hazelton (PM).

A. glaucum (Nutt.) Rydb.

Sisymbrium glaucum Nutt.

Stem 1-3 dm. high, glabrous; basal leaves spatulate, entire; stem-leaves lanceolate, sagittate; petals white, spatulate, 2 mm. long; pod erect, about 15 mm. long and 1 mm. wide, glabrous; style wanting. Alta. to Ida. and Colo. Alkali spots on range land, Windermere, Columbia Valley (DA).

ARABIS

Changes in name in accordance with R. C. Rollins "Monographic Study of *Arabis* in western North America" 1941.

A. columbiana Macoun=**A. sparsiflora** Nutt. var. **columbiana** (Macoun) Rollins.

A. canescens appears to be a name of confused application and not retained as a valid name by Rollins. Henry's description agrees very well with that of **A. Holboellii** var. **pendulocarpa** (A. Nels.) Rollins, except in the matter of height (Rollins gives only 10-25 cm.). This is widely distributed in the Dry Belt, and is one of the plants to which the name *A. canescens* has been applied.

A. lyrata var. *occidentalis*=var. **kamchatica** Fisch. Skeena Valley (DA); Hudson Bay Mt., Smithers (DA).

A. Nuttallii Robinson. Nicola (PM).

A. divaricarpa A. Nels.

A. brachycarpa (T&G) Britt.

Usually biennial; stems 1-few, from a simple or branching caudex, simple, or branched above, pubescent below or glabrous throughout, 3-9 dm. high; basal leaves broadly oblanceolate, usually acute, dentate to subentire, loosely stellate-pubescent, 2-6 cm. long by 4-8 mm. wide; cauline narrowly oblong to lanceolate, entire or the lower dentate, glabrous or the lower sparsely pubescent, auriculate; sepals oblong, glabrous to sparsely pubescent, scarious-margined, 3-5 mm. long; petals pink to purplish, 6-10 mm. long; pedicels

divaricate to loosely descending, slender, glabrous, 6-12 mm. long; pods straight or only slightly curved, loosely ascending, divaricate or nearly pendulous, glabrous, 2-8 cm. long, 15-20 mm. wide; style very short or absent; seeds narrowly winged, about 1 mm. wide, 1- or imperfectly 2-seriate. Que. to Alaska and southw. Chilcotin (PM); Lytton (PM); Crow's Nest Pass (Pullman); Prince George (DA); Smithers (DA).

A. microphylla Nutt. Perennial; stems slender, few to many from a subterraneous branched caudex, few-fld., usually simple, glabrous above, somewhat hirsute below with simple or forked hairs, rarely glabrous, usually less than 2 dm. high; basal leaves linear to oblanceolate, entire, acute, densely pubescent with stellate hairs (rarely almost glabrous); cauline few, narrowly lanceolate, auriculate, glabrous or the lower pubescent; petals pale rose to purplish, 4-6 mm. long; pedicels slender, 5-15 mm. long, divaricate to more ascending, usually glabrous; pods erect to obliquely spreading, straight to somewhat curved, narrow, glabrous, faintly nerved towards the base, 2-6 cm. long, 1-1.5 mm. wide; style less than 1 mm. long or absent; seeds orbicular, about 1 mm. in diam., narrowly winged, 1-seriate. Wash. and Ore., e. to Mont., U., and Wyo. Lillooet (PM).

var. **Macounii** (S. Wats.) Rollins. Stems numerous, 2.5-5 (-7) dm. high; basal leaves denticulate to entire; pedicels obliquely spreading; pods many on each stem, slightly to strongly curved, widely spreading. Mont. to Ida., U., and B. C. Revelstoke (type collection).

A. Whitedii Piper. Perennial; stems several from a slender tap-root, 2-5 dm. high, simple or branched, whole plant grey with a coarse stellate pubescence; basal leaves oblanceolate, 4-6 cm. long by 4-6 mm. wide, tapering to an elongated petiole; stem-leaves oblanceolate, 2-3 cm. long, narrowed to the base, not auriculate; racemes becoming elongated, many-fld.; petals white, 5 mm. long; pods erect on ascending pedicels, 12-16 mm. long by 1 mm. wide; seeds wingless. Osoyoos (DA); otherwise known only from two localities in eastern Wash.

ATHYSANUS

A. pusillus (Hook.) Greene. Crawford Bay, Kootenay Lake (DA).

BARBAREA

B. stricta Andrz. and **B. americana** Rydb. are retained by Abrams, but some recent authors refer them respectively to *B. orthoceras* Ledeb. and var. *dolichocarpa* Fern.

B. verna (Mill.) Aschers. Differs from **B. americana** in having 4-8 pairs of rather narrow lateral leaflets; pods sharply 4-angled, 5-6 cm. long. Introduced from Europe. Vancouver (DA).

BERTEROA

Annual or perennial herbs, stellate-pubescent or canescent, the leaves mostly narrow and entire. Flowers white in terminal racemes; petals 2-cleft; filaments 2-toothed at the base; pods oblong or globose, somewhat compressed; seeds several in each cell, winged.

B. incana (L) DC. Hoary Alyssum. Stems erect or ascending, 3-6 dm. high, hoary-pubescent, branched above; leaves lanceolate or oblong, 1-3 cm. long, obtuse, entire, the lowest narrowed into a petiole; fls. very numerous, 2-3 mm. across; pods canescent, swollen, oblong, 6-8 mm. long and about half as wide; style 2-3 mm. long. Introduced from Europe. Not general, but rather widely distributed and in some cases abundant, especially in old alfalfa fields; Boston Bar; Salmon Arm; Cascade; Christina L.; Spence's Bridge; Sunshine Bay, Kootenay L.; Salmo; Creston.

BRASSICA

The name *B. kaber* (DC) Wheeler var. *pinnatifida* (Stokes) Wheeler has been applied recently to the plant long known as *B. arvensis* (L) Ktze or *Sinapis arvensis* L.

B. alba (L) Rabenh. Cultivated in the Creston area and persisting or escaping.

B. campestris L. has become a prevalent weed in the coastal areas. It is a serious weed where swede turnips are grown for seed, crossing freely and yielding a worthless progeny.

BRAYA

B. americana (Hook.) Fern. Stems usually many, ascending, 1-10 cm. high, simple, purplish, pubescent with grey, forked, unequal hairs; leaves mostly in a basal rosette, fleshy, linear-oblanceolate, 6-30 mm. long by 0.5-2 wide, entire, glabrous, or more or less ciliate at base and apex; infl. 3-20-fld., rather dense, and usually with 1-3 rudimentary ones in the axils of the upper leaves; pedicels 1-4 mm. long, closely ascending; sepals subpersistent, usually purplish, 1.5-2.5 mm. long, oblong, apex rounded, margins hyaline; petals 1.5-4 mm. long, white becoming pink; stigma depressed-capitate, 2-lobed; pod lanceolate-subulate, 4-7 mm. long by 1.3-2 mm. wide, tipped by the slender style, 0.5-1 mm. long, valves puberulent, septum 1-nerved. Below Wapta Falls and at the head of Emerald Lake, Yoho, W. C. McCalla (DA).

B. glabella Richards. Leaves usually remotely denticulate; raceme becoming lax and elongated in fruit; fruiting stems 15-20 cm. high; mature pods almost terete, 10-12 mm. long on very short pedicels; style short and conical, appearing as a continuation of the pod.

Emerald Lake and near Field, Yoho, W. C. McCalla (DA).

The leaves in both the above sp. are glabrous, or nearly so, when mature; in **B. humilis** they are permanently and rather densely stellate-pubescent; the latter also has pods 18-30 mm. long.

CAKILE

C. edulenta should read **C. edentula.**

CARDAMINE

The presence of only 4 stamens is not diagnostic for **C. hirsuta** as it frequently occurs in **C. oligosperma.**

C. cordifolia A. Gray. Perennial from rootstocks, glabrous or nearly so; stem 3-6 dm. high; leaves all petioled, blades cordate, 2-5 cm. long, sinuately toothed; petals about 1 cm. long, white, obcordate or obovate; pods erect on ascending pedicels, 2-3 cm. long, 1.5 mm. wide; beak very short. Ida. to Wyo., Ariz. and N. M. Horsethief Ck., Windermere (Ulke).

C. Douglassii (Torr.) Britt.

C. purpurea Britt., not C&S.

Perennial from a tuberiferous rootstock; stems 15-40 cm. high, more or less pubescent; leaves simple, the lower slender-petioled, cordate, 1-3 cm. wide, sinuate, the upper ovate, subsessile, usually dentate; petals obovate, purplish, 8-12 mm. long; pod 2-3 cm. long; beak 3-4 mm. long. Que. to Alta., s. to Md. and Mo. Field (Ulke).

CHORISPORA

Annual or perennial branched herbs. Leaves entire or pinnatifid. Flowers long-pedicelled in racemes; sepals erect, the lateral ones swollen at the base; pods slender, cylindric, the cells not dehiscing at maturity; cells numerous, in two rows, at maturity each breaking off with its single enclosed seed.

C. tenella (Pall.) DC. Annual; 10-35 cm. high, glandular-puberulent; basal leaves in a rosette, 2.5-8 cm. long, lanceolate, sinuately lobed, petioled, mostly withered at flowering time; cauline entire to dentate, short-petioled; sepals oblong, 3-5 mm. long; petals 9-13 mm. long, purplish; pods 3-5 cm. long including the long beak; seeds embedded in spongy tissue. Introduced from Russia or Siberia. Somewhat resembling an Evening Stock and given in older English gardening books as a garden annual. Our first collection was made from a spot where it might have been a garden escape; later, it was sent in from range land with the comment that stock refused to eat it. Penticton (DA).

CONRINGIA

Erect glabrous annual herbs. Leaves entire, sessile. Flowers yellowish, in terminal racemes; sepals and petals narrow. Pods elongate, linear, 4-angled, valves 1-3-nerved; seeds 1-seriate, oblong, wingless.

C. orientalis (L.) Dumort. (HARE'S EAR MUSTARD). Stem erect, usually simple, 3-6 dm. high; leaves oval to elliptical, deeply cordate-clasping, 4-10 cm. long; petals yellowish-white, oblanceolate, 9-13 mm. long; pod ascending, usually 8-10 cm. long, about 2 mm. thick; beak 1-2.5 mm. long. Introduced from Europe. Railway Yards, Vancouver, and occasional throughout; not yet reported as a serious weed.

DESCURAINIA

Annuals or biennials with stellate pubescence. Leaves twice pinnatifid or finely dissected. Flowers small, yellow, in terminal racemes, much elongated in fruit. Siliques linear or clavate, slender-pedicelled, the valves 1-nerved; style short, thick. Seeds in 1 or 2 rows in each cell. Many of the forms given under *Sisymbrium* in Henry are now transferred to this genus. *Sisymbrium* in the restricted sense has the pubescence, if present, of simple hairs only.

Upper, as well as lower leaves, 2-3-pinnate; pods 15-30 mm. long, septum with 2-3 longitudinal nerves ..... *D. Sophia*

Upper leaves pinnate, the divisions often incised; pods mostly less than 15 mm. long; septum with 1 longitudinal nerve.

Pods more or less clavate; seeds typically 2-seriate ..... *D. pinnata*

Pods linear; seeds strictly 1-seriate ..... *D. Richardsonii*

1. **D. Sophia** (L.) Webb.

Sisymbrium Sophia L. (FLIXWEED).

Common throughout including lat. 54; Prince George, Vanderhoof, Smithers.

2. **D. pinnata** (Walt.) Britt.

Sisymbrium canescens Nutt.

A very variable sp. Our forms belong to the section with fruiting pedicels mostly spreading at an angle of about 45° (30°-70°); herbage not canescent.

Stems glandular and moderately pubescent ..... subsp. *brachycarpa*

Stems not glandular, or if slightly so, only sparsely pubescent or glabrous.

Pedicels slender and mostly longer than the pods; terminal leaflet usually much elongated; seeds frequently 1-seriate ..... subsp. *filipes*

Pedicels usually not longer than the pods; terminal leaflet not greatly elongated; seeds always 2-seriate ..... subsp. *intermedia*

subsp. **brachycarpa** (Richards.) Detl. Chiefly eastern but occurs in the Rocky Mt. region of Alta. and to be expected in B. C.

subsp. **filipes** (Gray) Detl.

Sisymbrium incisum var. *filipes* Gray.

S. longipedicellatum Fourn.

Our commonest form; widely distributed to lat. 54, Vanderhoof (DA); Anderson records it from Telegraph Creek, lat. 57.

subsp. **intermedia** (Rydb.) Detl. Less common; southern Interior.

3. **D. Richardsonii** (Sweet) O. E. Schulz. The typical form, canescent, non-glandular, with pedicels and pods closely appressed, is recorded by Detling from Lake Atlin, lat. 59.

subsp. **viscosa** (Rydb.) Detl. Pedicels and pods spreading; stem, axis of raceme, and sometimes the pedicels, thickly beset with glandular hairs. Lytton (DA); Rossland (DA).

D. Hartwegiana (Fourn.) Britt. is a sp. of Mexico and south, but the name *Sisymbrium incisum* var. *Hartwegianum* Wats. has been applied to forms of **D. Richardsonii.**

DRABA

D. incerta Pays. Stems densely caespitose, 2-4 cm. long, clothed below with persistent dead leaves; leaves crowded, linear or linear-spatulate, 4-10 mm. long with strong midrib, ciliate with long hairs and pubescent on both faces with shorter branched ones; peduncles slender, rather thinly and loosely stellate with short hairs, 2-4 cm. high, raceme in fruit 1-2 cm. long; petals yellow, fading white, about 3 mm. long; pods canescent-puberulent with mostly simple hairs, elliptic, 4-6 mm. long; style about 0.5 mm. long. Alta. and B. C. to Wyo. and Ore.

D. Paysoni J. F. Macb. var. **Treleasii** (Schulz) C. L. Hitchc. Differs from the preceding chiefly in the smaller and broader pods, 3-5 mm. long by 2.5-3.75 broad, pubescent to glabrous; peduncles and pedicels villous with branched hairs, and leaves more markedly ciliate. Wash. to Calif. and e. to Mont. and U. Paradise Mine, Windermere (PM).

The above two forms, which were published subsequent to Henry's Flora, appear to cover most records in our herbaria formerly referred to *D. alpina* L. and var. *glacialis* Dickie.

D. ruaxes Pays. & St. John. Caespitose; leaves crowded, broadly oblanceolate to suborbicular, 5-7 mm. long, spreading, midrib not prominent, densely pubescent with simple and forked hairs, sparsely ciliate towards the base; scapes slender, 2-4 mm. high; racemes short, compact, few-fld.; petals yellow, broadly emarginate, 3 mm. long; pedicels stout, 1-2 mm. long; pods ovate-elliptic, 5-6 mm. long, pubescent with simple hairs.

Coast ranges of B. C. to Glacier Peak, Snohomish Co., Wash. (Abrams).

ERUCASTRUM

Annual or perennial herbs with leafy, mostly branched, stems, hirsute with simple hairs. Leaves 1-2-pinnatifid, extending into the inflorescence as leafy bracts (an unusual character in Cruciferae). Sepals spreading to erect, not saccate at base. Petals yellow, often dark-veined. Pods linear; beak conical, usually 1-2-seeded; stigma capitate, entire or weakly 2-lobed; seeds 1-seriate.

E. gallicum (Willd.) O. E. Schulz. Stems 2-4 dm. high, retrorsely pubescent; leaves and habit resembling **Sisymbrium altissimum**; racemes at length elongated, loose; pedicels ascending to nearly horizontal, 6-10 mm. long in fruit; petals pale yellow, 5 mm. long; pods 25-35 mm. long, 1-2 mm. thick. Introduced from Europe. Our only record is a collection made on the railway at Kamloops by H. Groh. However, as it is well-established as a weed in sections of the Prairie Provinces, it may be expected to appear with increasing frequency.

HYMENOPHYSA

Perennial; pubescent with simple hairs. Stems branching, leafy. Leaves simple, sessile or clasping, entire or dentate. Flowers in racemes; petals white; pods subglobose, inflated; seeds 1-2 in each cell.

H. pubescens C. A. Mey. (Globe-Podded Hoary Cress). Rootstocks branching and long-creeping; stems 15-50 cm. high, hispidulous throughout, leafy to the infl.; leaves 1-6 cm. long, oblong to lanceolate, irregularly dentate, the cauline sessile and sagittate, the basal petioled; pedicels 2-8 mm. long;

pods 3-5 mm. long, puberulent; seeds 2 mm. long, brown. In the early stages, before the pods are developed, this plant is easily mistaken for **Lepidium Draba,** but from the flowering stage on it can be distinguished by the puberulent ovary (glabrous in **L. Draba.)** Native of the Altai Mts. and sparingly introduced in Turkestan alfalfa seed. Nicola (PM); Cawston, Keremeos (DA); 141 mile, Cariboo Road (DA).

LEPIDIUM

L. Draba L. var. **repens** (Schrenk) Thell. Differs from the sp. in having the pod lens-shaped and not at all cordate at the base. According to H. Groh the older infestations in B. C. are the typical form, while var. **repens** does not appear to have been introduced before 1926, probably in Turkestan alfalfa seed. Vernon; Summerland; Cawston, Keremeos. Recently the above forms of **Lepidium Draba** and **Hymenophysa** have been transferred by some authors to the genus *Cardaria,* the names becoming *C. Draba* (L) Desv. var. *repens* (Schrenk) O. E. Schulz and *C. pubescens* (C. A. Mey.) Rollins.

L. apetalum=**L. densiflorum** Schrad. The following forms have been distinguished, and all appear to occur in our territory.

Pods averaging 2.5 mm. long; pedicels slightly flattened.....var. *typicum* Thell.
Pods averaging 3 mm. long; pedicels distinctly flattened.
Pods glabrous.....var. *Bourgeauanum* (Thell.) C. L. Hitchc.
Pods pubescent
Pods pubescent throughout.....var. *pubecarpum* (A. Nels.) Thell.
Pods pubescent on margins only.....var. *elongatum* (Rydb.) Thell.
(*L. simile* Heller)

L. medium Greene=**L. virginicum** L. var. **medium** (Greene) C. L. Hitchc. Some recent authorities do not consider the western form even varietally distinct from the species.

L. strictum Ratt.=*L. oxycarpum* T&G., a Californian sp. collected by Macoun at Cadboro Bay, Victoria, in 1893. No recent record.

L. perfoliatum L. Annual or biennial; glabrous and glaucous, the stems diffusely branched, 2-6 dm. high; basal leaves 2-pinnatifid with linear segments; upper stem-leaves round-ovate, cordate-clasping, entire; pedicels 2-5 mm. long, ascending; petals yellow, 1-1.5 mm. long; pods 3-4 mm. long, rhombic-orbicular. Introd. from Europe; Kelowna (DA); Osoyoos and Cranbrook (H. Groh).

PLATYSPERMUM

A low scapose annual with lyrate basal leaves. Flowers solitary, minute; sepals broad, erect; petals white. Silicles suborbicular, strongly flattened parallel to the partition. Seeds in 2 rows in each cell, reticulate, broadly winged.

P. scapigerum Hook. Glabrous; leaves in a basal rosette, petioled, blades 3-15 mm. long, spatulate-oblong, entire or 3-7-lobed; scapes several, 2-15 cm. high; sepals 2 mm. long, a little shorter than the petals; pod 6-10 mm. long; seeds about 5 mm. in diam. including wing. (*Idahoa scapigera* Nels. & Macb.) Eastern Wash. and Ida. to Nev. and Calif. but occurs in the Victoria area; first collected in 1887 by Macoun near Goldstream; Observatory Hill (PM); Mt. Douglas (PM).

RORIPPA

(*Radicula*)

Radicula Nasturtium-aquaticum (L) Brit. & Rendle=*R. Nasturtium-aquaticum* (L) Schinz. & Thell. but some recent authors prefer *Nasturtium officinale* R. Br. (WATER-CRESS).

R. obtusa (Nutt.) Britt. Abundant around Cranbrook Slough (DA); Paradise Mine, Windermere (PM).

R. pacifica Howell does not appear to be given even varietal status by some recent authors. *R. palustris* (L) Bess. var. *pacifica* G. N. Jones and subsp. *occidentalis* (Wats.) Abrams are names in recent literature.

R. sylvestris (L) Bess. (CREEPING YELLOW CRESS). Perennial by branching, slender rootstocks; glabrous; stems ascending, 15-60 cm. high, branched above; leaf-blades ovate in outline, 2-9 cm. long, pinnate or deeply pinnatifid, the segments dentate or lobed; petals bright yellow, 4-5 mm. long; pod slightly curved, 8-15 mm. long and about 1 wide. Introduced from Europe. First recorded at Vancouver in 1911; now a pest, especially in gardens, in the Lower Fraser Valley, and becoming widespread; Vernon; Salmon Arm; Revelstoke; Smithers; Prince Rupert (lat. 54).

SISYMBRIUM

S. Loeselii L. Annual; stem 3-12 dm. high, usually branched, hirsute, retrorsely so below; basal leaves lyrately pinnatifid, petioled, withering early; cauline 2-4 cm. long, short-petioled, runcinate, the terminal lobe large, oblong-triangular, dentate, the lateral smaller, triangular-lanceolate; racemes up to 36 cm. in fruit; pedicels 3-12 mm. long; sepals 3-4 mm. long; petals yellow, 5-6 mm. long; pods linear, terete, ascending, mostly 2-3 cm. long; valves strongly 3-nerved; seeds 0.7-1 mm. long, ellipsoid, yellow-brown. Introduced from Europe. First recorded in 1934 (Miss J. Bostock; U), and now abundant, at Campbell Creek, e. of Kamloops; Athalmer, Columbia Valley (DA); Gang Ranch (DA); Alkali Lake (DA).

SMELOWSKIA

S. americana Rydb. is not considered distinct from the Siberian **S. calycina** (Desv.) C. A. Meyer. Tulameen Mt. (PM).

TEESDALIA

Small scapigerous annuals. Leaves in a basal rosette, pinnatifid. Flowers small, in a raceme; petals white; stamens with a scale at base of each filament. Pods orbicular or broadly ovate, strongly compressed at right angles to the septum. Seeds 2 in each cell.

T. nudicaulis (L) R. Br. Leaves spatulate or obovate to lanceolate, the earliest sometimes orbicular and entire, 5-20 mm. long, petiolate; scapes 1-few, 3-15 cm. high, raceme at maturity less than half the total length; petals less than 2 mm. long; pods 3-4 mm. long on pedicels less than twice as long. Introduced from Europe. Hope (U); well-established on the site of Jericho Air Station, Vancouver (DA).

CAPPARIDACEAE

CLEOME

C. serrulata Pursh. Local, but widely distributed in the Dry Belt; Ashcroft; Kamloops; Summerland; Penticton; Hedley; Allenby; Cranbrook; Chilcotin.

POLANISIA

Viscid-pubescent branching annuals with a strong disagreeable odor. Leaves palmately 3-5-foliolate or rarely simple. Flowers in simple terminal racemes, bracteate; sepals 4, deciduous; petals 4, slender or clawed; stamens 8-32, unequal; receptacle bearing a gland at base of ovary. Pod sessile or subsessile, elongate, cylindric or compressed, 2-valved from the apex. Seeds many, rugose or reticulate.

P. trachysperma T&G
Jacksonia trachysperma (T&G) Greene
Stems usually branched, 3-8 dm. high; leaves 3-foliolate, petioles 15-45 mm. long; leaflets oblanceolate to narrowly ovate, 15-25 mm. long; sepals lanceolate, purple-tinged; petals 8-12 mm. long, notched at apex, yellowish-white; stamens well-exserted, the longest about twice as long as the petals, purple; pods cylindric, 3-5 cm. long, narrowed at base to a very short stipe. B. C. through e. Wash. to n.e. Calif. and eastw. (Abrams). Also credited to B. C. by Rydberg.

DROSERACEAE
DROSERA

D. longifolia L.
D. anglica Huds.
Much less common than **D. rotundifolia** but widely distributed; Alberni, Forbidden Plateau and Ucluelet on V. I.; Swindle Is.; Revelstoke; Yoho; Reid Lake and Aleza Lake, lat. 54.; Prince Rupert.

CRASSULACEAE
RHODIOLA

Included in *Sedum* in Henry but separated by many authors. Differs in having fls. polygamous or dioecious; leaves scattered, not forming rosettes; carpels erect, not spreading.
R. integrifolia Raf.
Sedum integrifolium (Raf.) A. Nels. White-water Mine, Kaslo (DA); Kokanee Mt., Kootenay Lake (DA).
R. alaskana Rose, doubtfully distinct from the above, Q.C.I. (PM. Cat.)
Sedum obtusatum and **S. oreganum**, with petals joined at base, are often placed in the genus *Gormania*.

TILLAEA

T. aquatica L.
Tillaeastrum aquaticum (L) Britt. Apparently rare; our only additional record is Crawford Bay, Kootenay Lake (DA).

SAXIFRAGACEAE
CHRYSOSPLENIUM

C. glechomaefolium Nutt. Apparently rare; there are no specimens in our herbaria.
C. tetrandrum Th. Fries. Nicola (PM); Elk R. Valley (Pullman); Bridge River Mts. (DA); Cedar Ck., Cariboo (PM); Quesnel (DA).

HEMIEVA

H. ranunculifolia (Hook.) Raf.
Suksdorfia ranunculifolia (Hook.) Engler.
Bella Coola (PM); Botanie (DA); Rossland (DA); Crawford Bay, Kootenay L. (DA).
H. violacea (Gray) Wheelock.
Suksdorfia violacea A. Gray. Crawford Bay (DA); Paradise Mine, Windermere (PM).

HEUCHERA

H. chlorantha Piper. Caespitose from a stout rhizome; fl. branches leafless, or with 1-2 minute fimbriate bracts, villous, 5-8 dm. high; leaves all basal, orbicular to slightly reniform, rather deeply cordate at base, 4-8 cm. broad, crenately 7-9-lobed, the lobes with broad cuspidate teeth, glabrous

except on the veins beneath; petioles 5-20 cm. long, conspicuously villous with spreading or somewhat retrorse, usually brownish, hairs; infl. a dense narrow panicle, 5-10 cm. long, glandular-pubescent; fls. subtended by relatively large, ovate to lanceolate, foliaceous, fimbriate bracts; calyx greenish, deeply urceolate-campanulate, pruinose-puberulent, sepals oblong, 6-8 mm. long, lengthening in fruit; petals minute or absent. B. C. e. to Ida., s. to southern Ore. Victoria (PM); Alberni, V. I. (PM); Q. C. I. (PM. Cat.). The brief description of **H. cylindrica** in Henry may be this sp. as the flowers are given as "greenish".

H. cylindrica Dougl. differs from the above in being rather densely hirsute with white hairs on stems and petioles, and the calyx yellowish. Near Smithers, lat. 54 (DA).

H. Richardsonii R. Br. Acaulescent; flowering branches 3-4 dm. high, scapiform, sparingly short-hirsute and glandular-pubescent above; leaf-blades rounded-cordate, 3-6 cm. wide, with rounded lobes and broadly ovate teeth, sparingly hispidulous, ciliate on margins; *infl. open, not spicate; calyx strongly oblique, 1 cm. or more long;* petals spatulate, purplish, slightly exceeding the oblong calyx-lobes; *stamens slightly exceeding the calyx.* Man. to B. C. s. to S. D. McBride, lat. 53 (DA).

LEPTARRHENA

L. pyrolifolia (D. Don) R. Br.

L. amplexifolia (Stern.) R. Br. Given only from the Coast in Henry, but widely distributed in the mts. of the Interior; Nelson; Kokanee; Monashee Pass; Mt. Revelstoke; Yoho; Horsethief Ck., Columbia Valley.

MITELLA

M. caulescens Nutt. Alberni, V. I. (PM).

M. violacea Rydb.

Ozomelis violacea Rydb.

Close to **M. trifida** Grah. but sepals usually tinged with purple or rose and petals oblanceolate, entire or slightly and unequally toothed. Recorded by Ulke from two stations in Yoho Park and from Horsethief Ck., Windermere; otherwise known only from s. Montana.

PARNASSIA

P. palustris L. Frequent between Field and Golden (DA); Windermere, Columbia Valley (DA); Lac la Hache (PM); very common in lat. 54.

RIBES

R. acerifolium Howell. Garibaldi (DA); Grouse Mt., N. Vancouver (DA).

R. sanguineum Pursh, although typically a coast sp., occurs at New Denver (H. Levy, DA) and reported on the Arrow Lakes.

R. aureum Pursh. (Golden Currant). An erect shrub, 1-3 m. high with glabrous branchlets; leaves reniform-orbicular to obovate in outline, variously lobed or dentate, cuneate to subcordate at base, 5 cm. wide or less, glabrous, or pubescent and ciliate when young; racemes 3-7 cm. long, 6-15-fld.; calyx 6-10 mm. long, yellow, the oblong lobes shorter than the tube; petals purple, less than half as long as the calyx-lobes; berry 5-7 mm. diam., glabrous, yellow, red or black. Eastern Wash. to n.e. Calif. and eastw. Dry open places near Princeton (DB).

R. setosum Lindl.

R. saximontana E. Nels.

1 m. high or less; spines usually less than 1 cm. long; leaf-blades cordate or truncate at base, finely pubescent, at least when young, 1-4 cm. wide; fls.

1-4, white; calyx-tube cylindric, 5-8 mm. long, about twice the length of the lobes; petals one-half to two-thirds as long as the calyx and about equalling the stamens; berry red to black, smooth or somewhat bristly, 8-12 mm. in diam. Alta. and Sask. s. to Ida., Colo. and Neb. Strathcona Park, V. I. (PM. Cat.).

SAXIFRAGA

S. Van Bruntiae Small is considered by many authorities to be not distinct from the European **S. aizoides** L. Frequent in the eastern part of the province; Windermere; Kootenay National Park; Yoho; Kinbasket Lake, Big Bend Highway.

S. Tolmiei T&G. Mts. of V. I.; Garibaldi; Mt. Waddington.

S. rivularis L. Chilcotin (PM); Lake O'Hara, Yoho (Farr).

S. debilis Engelm. Corbin, Crow's Nest Pass (U); Lake Agnes, Yoho (PM); Chilcotin (PM); Garibaldi (PM).

S. Bongardi Presl is a name of uncertain application. Both Johnson and Abrams refer it to **S. ferruginea** Grah. which thus becomes a common sp. throughout; *S. Newcombei* Small is also included here by Johnson.

S. Mertensiana Bong. Cameron Lake, V. I. (U); Hope (DA); abundant at Silver King Mine, 6000 ft., above Nelson (DA).

S. aestivalis Fisch. & Mey. and **S. arguta** Don are considered distinct by recent authors. Abrams gives the following separation:—

Petals suborbicular to elliptic-obovate, with abrupt and slender claws; infl. elongate, widely paniculate-cymose ..... *S. arguta.*

Petals elliptic-oblong to ovate, gradually narrowed to short, relatively stout claws; infl. short, closely corymbose ..... *S. aestivalis.*

S. columbiana Piper. A Dry Belt sp. resembling **S. integrifolia** but differing in having the fls. in dense cymules; petals usually greenish (sometimes wanting) and mostly shorter than the petals. Wash. and Ore. east of the Cascades to Mont. Summerland (DA); Kaleden (DA); Osoyoos (DA).

TELLIMA

T. grandiflora (Pursh) Dougl. Sparingly in the mts. around Kootenay Lake (DA); Rossland (DA).

T. tenella Walp.=**Lithophragma bulbifera** Rydb. Frequent in the southern Okanagan; flowering earlier than **L. parviflora** (Hook.) Nutt.

ROSACEAE

AGRIMONIA

A. gryposepala Wallr. Recorded from several places in the Lower Fraser Valley; Tappen (U); Armstrong (U); n. of Hazelton, lat. 55 (DA).

A. striata Michx. Erickson (DA).

ALCHEMILLA

Our plant has a considerable synonomy. Abrams gives *A. occidentalis* Nutt; Peck gives *A. cuneifolia* Nutt.; it has also been named var. *occidentalis* Piper of the Old World *A. arvensis* L.

CHAMAERHODOS

Erect biennial or perennial herbs. Leaves ternately divided, the leaflets cleft into linear segments. Calyx top-shaped, 5-cleft, without bractlets. Petals 5, obovate, white or purplish, about as long as the calyx-lobes. Stamens 5, opposite the petals. Carpels 5-20, styles basal, filiform. Seed ascending, attached near base of style.

C. erecta (L.) Bunge var. **Nuttallii** T&G. Glandular-pubescent; root woody; stem 1-3 dm. high, leafy, often with ascending branches; fls. small, crowded in small rounded cymes. Sask. to Alaska, s. to S. D. and Colo. Dry sage-covered cliffs above Deadman's Creek, w. of Kamloops (Pullman).

GEUM

G. calthifolium Menzies. Ocean Falls (DA); Prince Rupert (PM).

G. rivale L. Frequent northwards; Lac la Hache; Chilcotin; Quesnel; Prince George; Smithers.

G. strictum Ait. Chiefly e. of the Cascades, ranging at least to lat. 54, but also occurring on V. I.; Alberni (PM).

POTENTILLA

P. oregana Nutt.=*P. Wrangelliana* Fisch. & Ave-Lall. or *P. glanduloso* Lindl. var *Wrangelliana* (Fisch & Ave-Lall.) Wolf.

P. corymbosa (Rydb.)=*P. Convallaria* Rydb. in Abrams but retained as the valid name in Peck.

P. dissecta Nutt. and *P. glaucophylla* Lehm. are included by Abrams in **P. diversifolia** Lehm. Peck retains **P. glaucophylla** as distinct.

P. Hippiana Lehm. Common in the Chilcotin as far west as Redstone (DA); Quesnel, lat. 53 (DA).

Additional Species

P. argentea L. (Silvery Cinquefoil). Stems many from a woody root-stock; branched, leafy, 1-5 dm. high, ascending, greyish-tomentose; stipules ovate-lanceolate to linear, usually entire; *leaves digitate,* all except the uppermost *5-foliolate;* leaflets glabrous and green above, *white-tomentose* beneath, obovate or cuneate, entire at base, divided above into narrow, acute divisions *with revolute margins; fl. numerous, cymose, 4-8 mm. wide;* bractlets oblong, obtuse, nearly equalling the ovate sepals; petals yellow, scarcely exceeding the sepals; achenes glabrous. Native of Eurasia and probably of eastern N. Am. Winlaw (DA); waste ground, Quesnel town (DA); railway yards, Prince George (DA); abundant on St. Mary's Prairie, Cranbrook, W. B. Johnstone (PM; DA); also reported from Armstrong, Revelstoke and Arrowhead (H. Groh).

P. emarginata Pursh. Near **P. uniflora.** Stems 2-10 cm. high, generally 1-2-fld., pilose; leaves ternate, pilose on both sides but not tomentose beneath; leaflets 0.5-1.5 cm. long, broadly obovate, with a cuneate base and broad teeth; sepals ovate, acute; petals broadly obcordate, a little exceeding the sepals, 5-8 mm. long. An arctic sp. extending southwards in the mts. Black Tusk, Garibaldi (DA).

P. pennsylvanica L. The var. **strigosa** Pursh is widely distributed in the Interior and the sp. may be expected in the eastern part of the province; distinguished by its taller stems, 4-8 dm. high, with appressed pubescence and without spreading hairs; leaves less deeply cut and segments broader. N. of Kimberley (DA).

P. paradoxa Nutt. Annual or biennial with decumbent or erect, simple or bushy stems, sparsely pubescent, 3-6 dm. high; stipules ovate-lanceolate, usually entire, ciliate; leaves petioled, *pinnately 7-11-foliolate;* leaflets obovate or oblong, 1-2 cm. long, deeply crenate, in age glabrous; *fls. in leafy-bracted cymes;* bractlets about equalling the oblong-ovate sepals, 3-4 mm. long; petals obovate-cuneate, slightly exceeding the sepals; *achenes with a thick corky swelling on the inner side.* Ont. and N. Y. to N. M. and e. Wash. Spence's Bridge, Prov. Mus. Report for 1920.

P. pentandra Engelm. Resembling **P. monspeliensis** but lower leaves 5-foliolate or ternate with the lateral leaflets 2-cleft to near the base; fls.

less than 5 mm. across; stamens rarely more than 5. Alta. and Sask., s. to Mo. and Ark. Vasseux L. (DA); Creston (DA); Lac la Hache (PM).

P. pulcherrima Lehm.

P. Hippiana var. *pulcherrima* Wats. Differs from **P. Hippiana** in having the upper surface of the leaves green and merely silky, instead of white-pubescent on both sides. Alta. and Sask. to N. M. and U. Recorded by Ulke from summit of Whale Mt., Yoho, and Horsethief Ck., Columbia Vy.

PRUNUS

P. emarginata (Dougl.) Walp. is very abundant across the southern part of the province especially at the Coast and in the Kootenay-Arrow Lakes area. The common form is var. **mollis** (Dougl.) Brewer, a tree up to 20 m., leaves tomentose beneath; pedicels and calyx pubescent.

P. demissa (Nutt.) Walp. appears to have a much more extensive range than the last, occurring through the Cariboo and Chilcotin, and frequent as a shrub in lat. 54. (Prince George; Fraser Lake); the common form in the southern Interior appears to be var. **melanocarpa** A. Nels. with leaves and young twigs glabrous, and fruit purple-black.

PURSHIA

P. tridentata (Pursh) DC. Common from Summerland s. to the Boundary.

ROSA

R. Sayi=**R. acicularis** Lindl. The commonest sp. in lat. 53-54.

R. Spaldingii Crepin. Close to **R. nutkana** but stems usually more slender; rachis and stipules less glandular; leaflets usually only simply toothed and not glandular beneath; calyx-lobes not glandular-denticulate. East of the Cascades, B. C. to Ore., Wyo. and U.

R. ultramontana (S. Wats.) Heller.

R. pisocarpa Gray var. *ultramontana* (S. Wats.) Peck

Close to **R. pisocarpa;** stems stouter; prickles often more numerous; leaflets narrower; calyx-lobes not glandular-hispid on the back. Mainly east of the Cascades, B. C. to Mont. and s. to Calif.

R. Fendleri Crep. differing from **R. Woodsii** in having the stipules, petioles and rachis conspicuously glandular, is recorded by Ulke from Horsethief Creek, Columbia Valley, "rare, at low alt.".

RUBUS

R. arcticus L. (including *R. acaulis* Michx.); near Spence's Bridge at 5200 ft. (U); Crawford Bay, Kootenay L. (DA); Taseko R., Chilcotin at 4500 ft. (GVC); common near Emerald L., Yoho (Ulke); common at highway levels in lat. 54-55 (Summit L., Reid L., Babine L. in DA).

R. laciniatus Willd. has become a pest on Lulu Is., Vancouver and adjacent territory, forming impenetrable masses. The Himalayan Blackberry, **R. thyrsanthus** Focke (*R. procerus* P. J. Muell.) with leaflets not laciniate and tomentose beneath, occurs occasionally as an escape.

R. lasiococcus A. Gray. Uncommon; Hozameen Range, Skagit Valley (U); Mt. Hopeless, Hope (DA).

R. macropetalus Dougl.=**R. vitifolius** C&S.

R. pubescens Raf. Apex, Nelson (DA); Kaslo (DA); Jesmond and Canim L, Cariboo (DA).

R. spectabilis Pursh is given as ranging into Ida. but appears to be rare in B. C. east of the Cascades; Glacier Gulch, Hudson Bay Mt., Smithers, lat. 55, abundant (DA).

R. strigosus Michx. is considered to be eastern only, our sp. being referred to **R. melanolasius** Focke.

R. transmontanus Focke. Lac la Hache (PM); Quesnel (DA).

SANGUISORBA

S. annua=**S. occidentalis** Nutt. Grindrod (DA); Cascade, Grand Forks (DA); Rykerts, Creston (DA).

S. microcephala Presl. Ocean Falls (DA); Calvert Is., lat. 51 (PM).

S. sitchensis C. A. Meyer

S. canadensis L. var. *latifolia* Hook.

Rare and subalpine in the south; Black Tusk Meadows, Garibaldi (DA); frequent at cultivation levels in lat. 54, Francois L., Hazelton, Houston, etc.; very abundant along the road from Topley to Topley Landing, Babine L.

SORBUS

Leaves pinnate; flowers rather small, in terminal compound cymes; carpels usually 3, styles distinct; fruit a berry-like pome, the carpel-walls not cartilaginous; otherwise as in *Pyrus*. The following sp. of *Pyrus* in Henry are more usually placed in *Sorbus*.

P. Aucuparia (L) Ehrh.=**S. Aucuparia** L.

P. occidentalis S. Wats.=**S. occidentalis** (S. Wats.) Greene.

P. sitchensis (Roem.) Piper=**S. sitchensis** Roem. A form occurring in the Rocky Mt. region and extending into Cariboo, with leaflets elliptic or oblong, acute or abruptly acuminate, and only 2-3 times as long as broad has been distinguished as *S. scopulina* Greene.

S. sambucifolia (C&S) Roem. sometimes appearing in reports of B. C. plants, is considered by G. N. Jones to be an Asiatic sp. occuring in N. Am. only in the most western Aleutians.

SPIRAEA

S. densiflora Nutt. Hollyburn Ridge, W. Vancouver (DA).

S. pectinata (Pursh) T&G=**Luetkea pectinata** (Pursh) Kuntze. One of the most constant features of the flora at about 4000 ft. and upwards.

S. pyramidata Greene is considered by many botanists to be a hybrid between **S. lucida** and **S. Menziesii,** and not uncommon where these occur; Yale; Beaverdale; Edgewood; Vanderhoof; in DA.

LEGUMINOSAE

ASTRAGALUS

3. **A. Mortoni** Nutt. *A. canadensis* L. var. *Mortoni* (Nutt.) S. Wats. Apparently widely distributed through the Interior as far north as Quesnel, but records probably include **A. canadensis** L. The following separation has been compiled from various sources but does not work out very well with some B. C. material.

Bracts linear-lanceolate, long attenuate, the lower almost as long as the calyces; calyx pubescence of white hairs; calyx-teeth all narrow, subulate; fully half as long as the tube ..... *A. canadensis*

Bracts ovate to lanceolate, scarcely half as long as the calyces; calyx pubescence mixed with black hairs; calyx-teeth short, less than half as long as the tube, the upper broader ..... *A. Mortoni*

4. **A. striatus** Nutt. *A. adsurgens* of Am. authors, not Pall. Merritt (GVC).

5. *A. hypoglottis* of Am. authors, not L.=**A. goniatus** Nutt.

9. **A. frigidus** (L) Bunge var. **americanus** S. Wats. Widely distributed; Kamloops; Canal Flats, Columbia Vy.; Kootenay Nat. Park; Field (Ulke); Jesmond, Cariboo; Chilco Lake, Chilcotin.

12. **A. alpinus** L. Chilco L. (DA), just east of the Coast Range.

13. **A. Macounii** Rydb. Choelquoit L. (DA); Chilco L. (DA); both in lat. 52.

14. **A. Bourgovii** Gray. Lake Wapta, Yoho (Ulke); Horsethief Ck., Columbia Vy. (Ulke).

16. *A. elegans* (Hook.) Britt.=**A. eucosmos** Robinson; Choelquoit Lake (DA).

19. The name *A. campestris* Gray is untenable, being preoccupied by a Linnaean sp. Our plant is **A. serotinus** Gray, common and widely distributed, especially in open woodland, from Lytton east to the Columbia Valley and north nearly to Quesnel, lat. 53. In B. C. it is the cause of a chronic poisoning of livestock which probably results in more losses than all other poisonous plants combined.

var. **Palliseri** (Gray) J. F. Macbr., distinguished by the pods being glabrous from the beginning, is credited to B. C. by Rydberg.

A. aboriginorum Richards.

A. aboriginum Richards. (Both names are in use).

Stems finely canescent to glabrate, erect, branched, 2-4 dm. high; stipules ovate, acute, 4-6 mm. long; leaflets 9-15, linear-oblong to elliptic or lanceolate, 1-3 cm. long, obtuse or acute; peduncles exceeding the leaves, loosely 10-15-fld.; calyx black-hairy, the tube 3-4 mm. long, the subulate teeth a little shorter; corolla 8-11 mm. long, standard yellowish, wings and keel purplish; pods compressed, half-elliptic, acute at both ends, glabrous, dorsal suture slightly intruded, stipe exceeding the calyx. Man. to Yukon, s. to Colo. and Nev. Columbia Valley, Fairmont (DA); Windermere (PM); Yoho (Ulke).

A. glareosus Dougl. Close to **A. Purshii** and apparently much commoner. Stems usually less than 5 cm. long; peduncles shorter than the leaves; corolla ochroleucous except the keel, which is tipped with purple. *A. Purshii*

Stems up to 10 cm. long; peduncles about as long as the leaves; all petals purple ..... *A. glareosus*

A. microcystis A. Gray. Perennial from a woody caespitose caudex; stems diffusely branched, decumbent or prostrate, 2-3 dm. long; strigose; leaves 3-6 cm. long; leaflets 9-13, oblong to elliptic-lanceolate, 6-12 mm. long, appressed-pubescent below, sparsely so or glabrous above; raceme exceeding the leaves, loosely fld.; calyx-tube 1.5 mm. long, white-strigose with often a few black hairs; lobes subulate, 1 mm. long; corolla rose-colored or white, 5 mm. long, the standard purple-veined; pod 1-celled, neither suture intruded, membranous, round-obovoid, 8-10 mm. long, 5-6 mm. wide, sessile, usually pubescent with spreading white hairs. Alpine, B. C. s. to the Olympic Mts., Wash., and e. to Montana (Abrams).

GLYCYRRHIZA

G. lepidota Nutt. Shore of Kootenay L. at Queen's Bay and Mirror L. (DA); near Jaffray, Crow's Nest Valley (DA).

HEDYSARUM

H. alpinum L. var. **americanum** Pursh

H. americanum (Michx.) Britt.

R. C. Rollins (Rhodora **42,** 1940) refers the plant described under *H. boreale* in Henry to the above; Mt. Splendor, V. I. (PM); Mt. Stephen, Yoho (Ulke). var. **grandiflora** Rollins is also credited to B. C. (Mt. Selwyn).

Fls. 12-15 mm. long; infl. elongated; stems nearly erect, 3-5 dm. high; var. *americanum*.

Fls. 15-18 mm. long; infl. subcapitate to somewhat elongated; stem decumbent, 2-4 (-5) dm. high ..... var *grandiflorum*.

H. sulphurescons Rydb. Yoho (Ulke); Columbia Valley south to Cranbrook (DA).

H. pabulare A. Nels. Closest to **H. Mackenzii** but taller, with smaller fls. and fewer segments to the pod. Stems 4-7 dm. high, finely strigose; leaflets 9-15, oblong or elliptic, 1-2 cm. long, glabrous above, cinereous-strigose beneath; fls. 12-15 mm. long, purple; calyx-tube about 2 mm. long, teeth subulate, 3-4 mm. long; pod minutely puberulent, segments 3-5, 5-7 mm. long. Mont.-N. M.-U. (Rydberg); Horsethief Ck., Windermere (Ulke).

LATHYRUS

L. littoralis (Nutt.) Endl. Clayoquot, V. I. (PM); Saanich Spit, V. I. (DA); Lang Bay (U).

L. pauciflorus Fern. Perennial, glabrous throughout; stems angled, rather stout, 6-9 dm. high; leaflets 6-12, oblong-elliptic to oblong-lanceolate, acute, 2-4 cm. long, prominently veined; stipules about half as large as the adjacent leaflets, entire or dentate below; peduncles equalling or exceeding the leaves, 3-7-fld.; calyx-teeth sparsely ciliate, the lower about as long as the tube; corolla 20-24 mm. long, violet; pod narrow, 3-5 cm. long, glabrous. V. I. to Ida., s. to Ore. Several records from V. I.; head of Bute Inlet (DA); Kincolith, Nass R., lat. 54 (PM).

L. polyphyllus Nutt. Much like the last but leaflets 10-20; stipules broad, nearly as large as the leaflets; peduncles shorter than the leaves; corolla 15-18 mm. long. Coniferous woods of the Coast region, B. C. to northern Calif. (Abrams).

LOTUS

Annual or perennial herbs. Leaves 3-5-foliolate. Flowers umbellate, white or yellow, often tinged with red; calyx-teeth subequal; standard ovate or orbicular; wings oblong to obovate; keel incurved, obtuse or beaked; stamens diadelphous. Pod straight or curved, linear or oblong, 1-several-seeded, usually dehiscent.

Hosackia bicolor Dougl.=**L. pinnatus** Hook. All sp. of *Hosackia* in Henry may be looked for under Lotus in recent manuals.

L. corniculatus L. (Bird's Foot Trefoil). Perennial from a straight, often woody, tap-root; glabrate or appressed-pubescent; stems slender, decumbent or ascending, 1-5 dm. long; leaves 3-foliolate, short-petioled; leaflets obovate to oblong, 6-20 mm. long, obtuse or acute; stipules like the leaflets and nearly as large; peduncles 5-12 cm. long; umbels 3-10-fld.; corolla bright yellow or standard streaked with red; pods linear 15-30 mm. long. Introduced from Europe as a forage plant for dry soils and occasionally escaping.

L. uliginosus Schk. (Tall or Marsh Bird's Foot Trefoil). Resembling the last but taller and more erect from a branching stoloniferous rootstock; umbels 5-12-fld. Introduced from Europe as a forage crop for moist situations; apparently well-established along roadside ditches at Queen's Park, New Westminster, and Pacific Highway west of Fry's Corner.

LUPINUS

The changes made, with the exception of the addition of **L. sulphureus**, are based on C. Piper Smith's treatment of the genus in Abrams' Ill. Flora and his revision of the material in the Provincial Museum.

1. **L. microcarpus** Sims. The B. C. form is var. **scopulorum** C. P. Smith (type from Beacon Hill Park, Victoria) distinguished by all the petals being light yellow in colour.

3. *L. hirsutulus* Greene=**L. nanus** Dougl. var. **apricus** (Greene) C. P. Smith.

4. **L. bicolor** Lindl. Both the sp. and var. **tridentatus** Eastw. occur on V.I. The sp. has 1-3 whorls of fls. 8-12 mm. long, lower lip of calyx entire or minutely 3-toothed; the var. has 3-6 whorls or more, fls. 6-8 mm. long, lower lip of calyx distinctly 3-toothed.

6. **L. polyphyllus** Lindl. var. **pallidipes** (Heller) C. P. Smith also occurs, distinguished from the sp. by the upper surface of the leaves being persistently pubescent.

7. *L. polyphyllus* Lindl. var. *grandifolius* (Lindl.) C. P. Smith; L. *grandifolius* Lindl. Confined to Calif. according to Abrams' F.

8. *L. argenteus* Pursh is of doubtful occurrence in B. C. Tidestrom (F. of U and Nev.) gives the range as N. D. to N. M., Col., and U. Specimens in PM so named were transferred to **L. sericeus** and **L.s. flexuosus** by Dr. Smith.

9. **L. arcticus** S. Wats. In addition to the typical sp. the following vars. also occur;—

var. **prunophilus** (M. E. Jones) C. P. Smith; keel ciliate on upper edges; coarser in all its parts and more villous; largest leaflets up to 8 cm. long.

var. **subalpinus** (Robinson) C. P. Smith; keel ciliate or not; leaflets cuneate to spatulate, rounded or obtuse at apex.

21. **L. sericeus** Pursh is the most abundant and widespread sp. in the Interior; also occurring is var. **flexuosus** (Lindl.) C. P. Smith, differing from the sp. in lacking the spreading hairs below the infl.; pedicels with spreading pubescent; floral bracts often subpersistant, equalling or exceeding the buds; Cranbrook (PM).

Additional Species

A. The first three belong to the section **Calcarati**; perennial; calyx usually slightly to strongly gibbous; keel non-cilate or so only between middle and apex.

L. leucopsis Agardh. Appressed-silky, erect, branched, 3-8 dm. high; lower leaves long-petioled, *all densely silky on both sides,* petioles slender, the upper about as long as their leaflets; leaflets 5-8, folded, linear-oblanceolate, acute, largest 4-5 cm. long, racemes 6-12 cm. long, whorls 6-10, bracts deciduous, pedicels 2-4 mm. long, loosely appressed-pubescent; fls. spreading or ascending, 10-12 mm. long, calyx densely appressed-silky, subsymmetrical to subgibbous, upper lip bidentate, lower entire; petals violet-blue or pale purple, standard hardly reflexed, glabrous; wings glabrous; keel arcuate, its lower bend somewhat exposed; pods 20-25 mm. long, 5-6 wide, ovules 4 or more. Our plants, so far as known, belong to var. **dubius** C. P. Smith, distinguished by flat, greenish-subsilky leaflets radially spreading, up to 7 cm. long; petioles ascending; *keel ciliate.* Kaslo; Creston; both PM.

L. oreganus Heller. Thinly appressed-silky, scarcely branched, erect, 4-6 dm. high; lower leaves long-petioled, scattered, *glabrous above,* petioles 5-15 cm. long, leaflets about 10, oblanceolate, acute, 4-8 cm. long, 7-12 mm. wide; peduncles 5-10 cm. long, racemes 15-25 cm. long; fls. 10-12 mm. long, scattered or subverticillate, pedicels 7-12 mm. long, appressed-pubescent; calyx scarcely gibbous, upper lip notched, largely concealed by reflexed sides of standard, lower lip entire; petals blue or purplish, standard glabrous or scantily pubescent on back; wings glabrous; *keel* falcate, *non-ciliate.* Victoria (PM).

L. sulphureus Dougl. Appressed-subsilky, erect, 4-10 dm. high; lower leaves long-petioled, pubescent both sides but greenish, petioles 4-20 cm. long, leaflets 9-15, narrowly oblanceolate, acute, 3-6 cm. long; peduncles 3-6 cm. long, racemes 10-20 cm. long, rather dense; fls. 10-12 mm. long, scattered or subverticillate, pedicels 4-8 mm. long, usually appressed-pubescent, bracts deciduous; calyx from scarcely to strongly gibbous, upper lip bidentate,

lower entire; *petals pale sulphur yellow,* rarely bluish, standard more or less pubescent on back, wings glabrous, keel ciliate between middle and apex; pods silky, 2-3 cm. long, ovules about 4. Abundant locally; n. of Summerland; Kaleden; along road to Keremeos (DA).

B. The following sp. is distinguished from all others in our area, except **L. microcarpus,** by having the keel ciliate on the upper margins from the middle to near the claws, not between middle and apex.

L. latifolius Agardh. Perennial; glabrate or minutely appressed-pubescent, rarely with some spreading hairs, 6-12 dm. tall; largest leaves near middle of stem and long-petioled; lower leaves usually withered by fl. time; petioles about equalling their leaflets, which are 5-8, broadly oblanceolate, usually acute, 4-10 cm. by 1-3; peduncles 8-20 cm. long; racemes rather loosely-fld., 15-45 cm. long; fls. verticillate or scattered, 10-14 mm. long; bracts early deciduous; pedicels 6-12 cm. long, spreading-pubescent; upper calyx-lip notched, lower entire; petals blue or purple, rarely yellowish, fading brown, standard suborbicular, glabrous, 9-10 mm. wide; wings truncate or incurved on lower edge, the keel somewhat exposed, arcuate with slender tip; pods dark-brown, about 30 by 6-8 mm., ovules 7-10, seeds about 4 mm. long, mottled with dark brown. A complex sp.; our plants so far as known belong to the following:—

var. **columbianus** (Heller) C. P. Smith; 4-24 dm. high; wing-petals broaded than in the typical sp., out-curving on the lower free edges, thus covering all or most of the keel; V. I.; Bella Coola; Garibaldi; in PM.

var. **canadensis** C. P. Smith. Differs from the last in having the leaflets consistently pubescent above with short appressed hairs. Common on V. I.; Mt. Cheam; Mt. McLean, Lillooet; Mt. Revelstoke. Apparently restricted to B. C.

OXYTROPIS

O. deflexa (Pall.) DC. Chilcotin (Chezacut and Bidwell Creek, DA). *O. monticola* Gray is a purple-fld. more southern sp. The one under this name in Henry is **O. gracilis** (A. Nels.) K. Schum.; frequent throughout; Smithers, lat. 55 (DA).

O. alpicola (Rydb.) Jones. Dwarf acaulescent perennial; leaflets 9-13, oblong or elliptic, obtuse or acutish, 5-8 mm. long, white-silky-strigose; scapes 2-6 cm. long, strigose; spike subcapitate, 3-8-fld.; calyx mostly dark with black hairs, tube 5-6 mm. long, teeth subulate, 2 mm. long; corolla yellowish-white, about 15 mm. long, wings broad and broadly emarginate; pod about 15 mm. long, subcoriaceous, ovoid, short-beaked, nearly 2-celled. High mts., Alta., B. C. and Mont. Mt. President, Yoho, at 8000 ft. (Ulke); Horsethief Creek, Columbia Valley, at over 9000 ft. (Ulke).

O. splendens Dougl. Close to **O. Richardsonii** from which it differs in having bracts 1-2 cm. long and much exceeding the fls.; leaflets linear-lanceolate. Man. and Minn. to B. C. and Mont. Horsethief Creek, Columbia Valley (Ulke).

THERMOPSIS

Perennial herbs with palmate 3-foliolate leaves and foliaceous stipules. Flowers large, yellow, in terminal racemes. Calyx campanulate, the 5 teeth equal or the 2 upper united. Standard nearly orbicular, equalling the oblong wings, the keel nearly straight. Stamens 10, distinct. Ovary sessile. Pod linear or oblong, usually flat, straight or curved.

T. rhombifolia (Nutt.) Richards. Stems several, glabrous, or strigose above, 1-3 dm. high; stipules ovate to suborbicular, 1-2 cm. long; leaflets rhombic-obovate to oblong-lanceolate, 2-3 cm. long; corolla 15-20 mm. long; pods 5-6 cm. long, recurved-spreading. Sask. and Neb. to Colo. and Mont. Summerland (U); Goat Mt., Erickson (DA); Field (Ulke).

T. gracilis Howell
T. montana var. *ovata* Robins.
Stems 5-10 dm. high; stipules ovate to lanceolate, 2-5 cm. long; leaflets oval to obovate, 3-7 cm. long; pod straight and erect in fruit. B. C. and w. Mont. to Calif. (Abrams).

TRIFOLIUM

T. cyathiferum Lindl. Above Rossland at about 4500 ft. (DA).
T. albopurpureum T&G. Annual, villous-pubescent, the stems slender, ascending or somewhat decumbent, 1-4 dm. high; stipules ovate-lanceolate, entire; leaflets 1-2 cm. long, cuneate-oblong, obtuse, denticulate above the middle; heads long-peduncled, ovoid, 8-15 mm. long; *fls. sessile, not becoming reflexed; calyx villous;* corolla purple, 6-7 mm. long, *scarcely equalling calyx;* pod glabrous or sparsely hairy at apex, 1-seeded. B. C. to southern Calif. Near Victoria (PM).
T. arvense L. Annual, silky-pubescent, stems erect, branching, 15-45 cm. tall; leaves short-petioled; stipules narrow, subulate-tipped, entire or nearly so; leaflets linear or oblanceolate, denticulate above, obtuse and often emarginate, 12-25 mm. long; heads terminal, *oblong,* 12-25 mm. long, fls. sessile, not becoming reflexed; calyx 5-6 mm. long, *the teeth plumose, much longer than the tube and the pale pink or white corolla.* Introd. from Europe; Englishman's R., V. I. (PM. Cat.); Alberni, V. I. (DA); Yale (DA); abundant along lake-shore at Nakusp (DA).
T. fragiferum L. (Strawberry Clover). Perennial; *stems prostrate and rooting;* leaflets obovate, 8-15 mm. long, glabrous; heads globose on long axillary peduncles, 12-14 mm. long but enlarging after flowering; corolla very small, pink or purplish; *calyx in fruit becoming much inflated, scarious, and strongly reticulate.* Introduced from Europe as a forage plant for alkali land. C.N.R. yards, Vancouver (DA).
T. macrocephalum (Pursh) Poir. Perennial, sparsely villous throughout or becoming glabrate; stems stout, about 1-2 dm. high; *leaflets 5-7,* 1-2 cm. long, cuneate or obovate, obtuse, mucronate, serrulate; heads about 3 cm. long, short-ovoid; calyx villous, the lobes subulate, plumose, 10-15 mm. long; corolla purplish, *20-25 mm. long;* pod stipitate. B. C. and Ida. to north-eastern Calif. (Abrams).

VICIA

V. Cracca L. Becoming widespread; V. I.; Vancouver; Ainsworth, Kootenay L.; Quesnel; Prince Rupert.
V. hirsuta (L) Koch. C.N.R. yards, Vancouver (DA); Deroche (DA).
V. tetrasperma (L) Moench. Resembling the last but peduncles usually only 1-2-fld. (rarely up to 6); pod glabrous with 3-6 (usually 4) seeds. Introd. from Europe; Sidney, V. I. (PM. Cat.); White Rock (DA).

LINACEAE

LINUM

L. Lewisii Pursh is given in Henry only from "eastern B. C." but it occurs as far west as Ashcroft and Williams Lake, extending west again from the latter place across the Chilcotin at least as far as Redstone.

OXALIDACEAE

Annual or perennial herbs, acaulescent or leafy-stemmed, the leaves palmately 3-foliolate (in our sp.), usually with scarious stipules. Flowers umbellate, cymose, or solitary, perfect, regular; sepals 5; petals 5, distinct or slightly united at the base; stamens 10-15; ovary superior, 5-celled, the carpels usually distinct above. Fruit a globose or elongate loculicidal capsule, rarely a berry.

OXALIS (Wood Sorrel)

Leaves long-petioled, leaflets obcordate. Peduncles axillary. Stamens usually 10, filaments usually united at the base. Capsule 5-angled, 5-celled, the valves remaining attached to the axis by the partitions.

O. corniculata L. Perennial, nearly glabrous; stems erect or decumbent, 3-20 cm. high; leaves green or purplish; peduncles subumbellate or at length cymose, 1-3 (-6)-fld.; petals yellow, 6-12 mm. long; capsule 10-18 mm. long, sparingly pubescent with spreading hairs; pedicels spreading, not deflexed in fruit. Introd. from Europe; Nanaimo, V. I. (Macoun); Nelson (DA).

O. repens Thunb. Perennial; stems prostrate and rooting at the nodes, the numerous erect branches mostly less than 10 cm. high; fls. 2-5, small, on very short, at length deflexted, pedicels. Introd. from Europe. A troublesome garden weed in Vancouver.

O. stricta L. Pale green, appressed-pubescent, stems usually several, decumbent; pedicels 1-4 (mostly 2), at length deflexed; pod 15-23 mm. long. P. E. I. to B. C. (Deam).

GERANIACEAE

G. erianthum DC. Between Houston and Smithers, lat 54½ (DA); Moricetown, lat. 55 (DA).

POLYGALACEAE

Flowers in racemes, spikes, or solitary, perfect and irregular. Sepals 5, the 2 lateral large and petaloid. Petals usually 3, hypogynous, more or less united. Stamens 4-8, mono- or diadelphous. Ovary 2-celled with one ovule in each cell.

POLYGALA

Herbs or shrubs with alternate, opposite or whorled leaves. Flowers very irregular; calyx persistent, of 5 sepals of which 3 (the uppermost and 2 lowest) are much larger and petaloid; petals 3, connected with each other and with the stamen-tube, the middle (lower) one keel-shaped and often crested on the back; stamens 6 or 8, their filaments united below into a split sheath or into 2 sets, cohering more or less with the petals but free above. Fruit a small loculicidal 2-celled pod, much flattened contrary to the very narrow septum.

P. vulgaris L. Perennial; stems many, 5-25 cm. tall, usually glabrous; leaves alternate, 1-4 cm. long, lower oblong to obovate, upper lanceolate to linear; fls. 4-8 mm. long, blue, pink, purple or white, in terminal racemes. Native of Europe; apparently established near Comox, V. I. (PM).

EUPHORBIACEAE

EUPHORBIA

E. glyptosperma Engelm. Widely distributed in the Interior, n. to Williams Lake (DA) and probably farther; much commoner than **E. serpyllifolia.**

E. Cyperissias L. (Cypress Spurge). Perennial from creeping rootstocks; glabrous; stems erect, scaly below, leafy above, up to 3 dm. high, branched; leaves linear to almost filiform, those at base of infl. whorled, others alternate, sessile, 10-25 mm. long by 1-3 wide; umbels many-rayed; glands of involucre 4, crescent-shaped; capsule globose, granular; seeds oblong, smooth. Introd. from Europe; commonly cultivated and occasionally escaping.

E. Esula L. (Leafy Spurge). Stems 3-15 dm. high, stout, leafy, dull green, glabrous, from deep-seated, brown, woody, extensively spreading rootstocks; leaves 15-60 mm. long, alternate, linear to oblong, except the whorl at base of umbel, which are lanceolate to ovate; lower fls. on axillary

peduncles 2-6 cm. long, others in a terminal umbel; floral bracts 6-9 mm. long, yellow-green, subcordate, apiculate; involucre subcampanulate, 2-3 mm. long with 4 crescent-shaped glands; capsule nodding, smooth or roughened, about 3 mm. long; seed oblong, nearly 2mm. long, smooth, greyish to violet-brown. Introd. from Europe; a pernicious weed, very difficult to control. Kamloops, Tappen, Sicamous, Armstrong, Vernon and Gang Ranch (Cariboo) and probably elsewhere in the Interior.

E. exigua. (DWARF SPURGE). Annual, glabrous, branching from the base, 5-25 cm. high; leaves numerous, linear to linear-lanceolate, entire, 10-25 mm. long, often broadening to the tip and truncate and apiculate; umbel with 3-5 primary rays, often forking above; glands crescent-shaped; seeds small, grey, transversely wrinkled. Introd. from Europe; southern V. I. (Duncan; Cadboro Bay; Beacon Hill Park, Victoria; all in DA.).

E. Helioscopia L. (SUN SPURGE). Annual, glabrous or nearly so; stem stout, usually erect, simple or branched, 15-30 cm. high; leaves, except the whorl at base of umbel, alternate, oblong to nearly orbicular but usually obovate, 1-5 (-10) cm. long, serrulate, narrowed to a short petiole; involucre oblong-campanulate, 2-3 mm. long; glands usually 4, stalked, oval to orbicular, entire; seeds almost round, reddish-brown with deep reticulations. Introduced from Eurasia; V. I. (Victoria and Comox in DB); abundant along roadsides at Windermere, Columbia Valley (DA).

ANACARDIACEAE
RHUS

R. diversiloba T&G. Nanaimo, V. I. (U); Bowen Is., Howe Sound (U); Texada Is. (PM).

RHAMNACEAE
RHAMNUS

R. Purshiana DC. Given by Henry only from w. of the Cascades, but the type was collected in Idaho where St. John states it is common. It may be expected, therefore, to range as far east in B. C. Revelstoke (DA); Crawford Bay, Kootenay Lake (DA).

BALSAMINACEAE
IMPATIENS

I. biflora Walt. is a sp. occurring chiefly, if not entirely, east of the Cascades (Monte Creek; Malakwa; Crawford Bay; in DA) while **I. occidentalis** Rydb. is found west of them (Hope; Popcum; Mt. Cheam; in DA). The latter is considered by Washington authors to be identical with the European *I. nolitangere* L. The flowers may be 3 cm. long.

I. ecalcarata Blank. Crawford Bay, Kootenay Lake (DA).

I. Roylei Walp. Annual; stems 3-15 dm. high, much branched; lower leaves opposite, about 1 dm. long, upper usually in whorls of 3, ovate or ovate-lanceolate, sharply serrate; fls. in axillary long-peduncled clusters of 3 or more, very numerous towards top of plant, purple, 2-3 cm. long; spur 3-6 mm. long, almost straight. Native of the Himalayas; well established and spreading along Still Creek, Burnaby and in ditches at West Vancouver (DA); Prince Rupert (H. Groh).

MALVACEAE
MALVA

M. rotundifolia L. In eastern N. Am. it has been found that much of what has passed under this name is **M. neglecta** Wallr. The separating characters are given as follows by Deam;—

Plants erect; petals pinkish-white, about 5 mm. long; carpels 8-11 (usually 10), more or less pubescent and rugose on the back; suture

betw. carpels more or less crested ..... *M. rotundifolia*
Plants procumbent; petals pale blue, about 10 mm. long; carpels 12-15, more or less pubescent but smooth or faintly reticulate on the back; suture betw. carpels not raised, usually depressed ..... *M. neglecta*

The description under **M. rotundifolia** in Henry fits **M. neglecta** better; all specimens in DA appear to be the latter.

M. parviflora L. Stems erect, 2-6 dm. high; leaves shallowly 5-lobed, crenate-dentate, on long petioles; calyx 5-6 mm. long, becoming papery and reticulate in fruit; *corolla little longer than the calyx,* pale lilac or white; *carpels strongly cross-rugose,* short-pubescent. Introduced from Europe; vacant lots, Victoria (DA).

M. sylvestris L. Stems erect or ascending, pubescent or glabrate, 6-9 dm. high; leaves orbicular or reniform, 3-10 cm. wide with 5-9 shallow, angular or rounded lobes, crenate-dentate, truncate or cordate at base; fls. *reddish-purple, 25-40 mm. across,* in axillary clusters; *petals 2-4 times as long as the calyx;* carpels about 10, *reticulate.* Native of Eurasia; waste ground, Nanaimo, V. I. (DA); roadside, Vancouver (DA).

MALVASTRUM

M. coccineum (Nutt.) A. Gray=**Sphaeralcea coccinea** (Nutt.) Rydb. Abundant on dry hill-sides near Windermere, Columbia Valley.

SIDALCEA

S. campestris Greene. Close to **S. Hendersoni** but taller, 6-15 dm. high; racemes loosely fld. rather than spicate; corolla pale pink, pale lilac or nearly white, 20-25 mm. long in perfect fls. but much shorter in pistillate ones; carpels strongly reticulate. B. C.-Mont.-Ida.-n.Calif. (Rydberg); ascribed to B. C. in several Floras.

S. oregana (Nutt.) A. Gray differing from the last in having pubescence of calyx and stem stellate, with few or no long hairs, has also been ascribed to B. C.

HYPERICACEAE
HYPERICUM

H. perforatum L. has spread extensively in the Lower Fraser Valley and is now abundant around Yale.

H. Scouleri Hook. is usually found in moist or wet ground; lake shores, stream sides and mt. meadows.

H. majus (A. Gray) Britt.
H. canadense L. var. *majus* A. Gray

Annual or perennial by offsets; stem erect, simple below, 2-9 dm. high; leaves lanceolate or oblong-lanceolate, sessile or clasping, 2-6 cm. long, 5-7 ribbed; sepals slightly shorter than the petals, lanceolate, acuminate; petals ovate or obovate, 2-3 mm. long, without black glands; stamens 5-10; styles 3; capsule narrowly conic. Me.-N. J.-Colo.-Wash.-B. C. (Rydberg).

H. Nortonae M. E. Jones. Perennial; stems 10-15 cm. high; leaves oval or round-oval, obtuse, 15-25 mm. long; fls. 1-3; sepals ovate, obtuse, about 2.5 mm. long; petals narrow, 10-15 mm. long, strongly many-nerved; sepals and petals usually with black glands; pod 3-lobed at apex. Differs from **H. Scouleri** in its shorter stems, fewer fls., and relatively larger petals. Glacier Park at 6500 ft., J. M. Fogg (U).

ELATINACEAE

Herbs or shrubs (ours low aquatic herbs) with opposite or whorled, stipulate leaves. Flowers inconspicuous, perfect, regular, solitary or clustered in the leaf-axils; sepals 2-5, persistent; petals 2-5 hypogynous; stamens as

many, or twice as many, as petals; pistil of 2-5 united carpels, the ovary 2-5-celled. Fruit a many-seeded septicidal capsule with axial placentae.

ELATINE

Very small glabrous annuals, creeping or floating, with opposite or whorled leaves. Flowers minute, usually solitary, 2-4-merous. Capsule globose with 2-4 membranous valves. Seeds straight or curved, longitudinally and transversely striate, or with rows of pits.

E. americana (Pursh) Arn. Annual; 1-5 cm. high, often submerged; stems stout, soft and spongy, branched, erect to creeping and rooting; leaves 3-5 mm. long, oblong or obovate, sessile; fls. very minute, the parts usually in 2's (rarely in 3's); capsule 2-2.5 mm. long; seeds curved, with 9-10 longitudinal and 20-30 cross ridges. Que.-Tex.-Calif.-B. C. (Rydberg). Alberni, V. I. (PM. Cat.)

VIOLACEAE

VIOLA

V. canadensis L. It is doubtful if this sp. occurs in B. C. What has passed under this name is **V. rugulosa** Greene (*V. Rydbergii* Greene), a plant larger in all its parts but distinguished most readily by its copious underground stolons; extends north to Hazelton, lat. 55½.

V. cyclophylla Greene=**V. palustris** L. according to Rydberg.

V. montanensis Rydb. Horsethief Creek, Windermere (Ulke).

V. sempervirens Greene var. *orbiculata* (Geyer)=**V. orbiculata** Geyer. Distinguished from **V. sempervirens** by the absence of stolon-like stems; leaves not brown-dotted beneath; lateral petals little if at all bearded; Mt. Apex, Penticton (DA); above Nelson at 4000 ft. (DA).

V. sempervirens subsp. **orbiculoides** M. S. Baker. B. C. and Wash. Mt. Arrowsmith, V. I. Differs from the typical sp. in its dwarfer habit and having its few short stems ascending instead of prostrate and rooting; from **V. orbiculata** by the character of the leaves, which in this latter are larger, thinner and more nearly circular; the leaves of ssp. **orbiculoides** are much thicker and similar to those of the typical sp.; also both forms of **V. sempervirens** are plants of the Coast region while **V. orbiculata** is a sp. of the Interior.

V. vallicola A. Nels.

V. Nuttallii Pursh var. *vallicola* (A. Nels.) St. John.

It is doubtful if true V. Nuttallii occurs in our area. The above, which is common in the southern Okanagan, is distinguished by the basal leaves being elliptic to ovate and obtuse, instead of lanceolate and more or less acute.

Additional Species

V. lanceolata L. Glabrous; stemless; profusely stoloniferous in late summer, the stolons rooting at the nodes; rootstock slender; scapes 5-10 cm. long; leaves lanceolate or elliptic, 6-15 cm. long, 1-2 wide, gradually tapering to a margined petiole, obscurely crenulate; sepals lanceolate, acuminate, 4-6 mm. long; petals white, 6-8 mm. long, usually all beardless, the 3 lower with purplish veins; capsule ellipsoid. N. S. to Minn. and southwards. Apparently well-established and spreading on blueberry farms on Lulu Is., Vancouver, presumably brought in with blueberry plants from eastern N. Am.

V. McCabeiana M. S. Baker. Stemless; without stolons; rootstock slender, elongated; early leaf-blades small, round-cordate, regularly crenate, scarcely pointed at apex, often purple-tinged, 13-25 mm. long by 15-27 mm. wide; later leaves conspicuously elongated, with a sharpened apex and serration, glabrate or somewhat pubescent on the upper face; stipules conspicuous in spring, ovate to oblong-lanceolate, irregularly toothed, 6-8 mm. long,

becoming scarious and disappearing later; peduncles stout, 7-19 cm. long; sepals oblong-lanceolate, entire, scarious-margined, obtuse, the callous tip conspicuous; corolla 15-25 mm. in diam., purplish-lavender with lighter centre; lower petal bearded, about 16 mm. long including the blunt yellowish spur, 3 mm. wide by 2.5 mm. long; lateral petals bearded, about 13 mm. long by 6 mm. wide; style nearly 3 mm. long, clavate, beak short, pointing downwards and outwards. Swamps and wet ground; known only from B. C.; the following stations are given by M. S. Baker; Indianpoint Lake, Cariboo; Kinbasket Lake, Big Bend Highway; Canal Flats and south end of Columbia Lake.

V. simulata M. S. Baker. A segregate from **V. Langsdorffii** Fisch. from which it differs in not being succulent, especially as to petioles and peduncles; creeping stems short and never erect; leaves crenate instead of crenate-serrate; flowers smaller with narrower petals and a much smaller spur; and especially in the style which is barely expanded into a head and very short-beaked, whereas in **V. Langsdorffii** the head is broad and the beak conspicuous. From **V. palustris** it differs in the complete absence of stolons and in the style-head, which in **V. palustris** is expanded into a disc. B. C. to Ore. Type collected by J. K. Henry at Shawnigan L., V. I., and identified by Dr. Brainerd as **V. Langsdorffii.**

V. tricolor L. var. **arvensis** (Murr.) Boiss. (Field Pansy). Annual; stems 1-3 dm. high, spreading or decumbent, glabrous or rough-puberulent; leaves ovate to lanceolate, coarsely crenate-serrate, 15-30 mm. long; stipules very large, cut into linear segments with a large, leaf-like, terminal one; petals 7-10 mm. long, usually shorter than the sepals, pale yellow or whitish, often tipped with violet; spur very short; style enlarged upwards into a globose hollow summit. Introd. from Europe; Saanich, V. I.; Agassiz (H. Groh); very abundant in orchards around Kootenay Lake (DA).

LOASACEAE

MENTZELIA

M. integrifolia (Wats.) Rydb.=**M. dispersa** Wats. In addition to the typical sp. var. *compacta* (A. Nels.) Macbr. may also occur.

Middle cauline leaves often mostly lanceolate; plants rather loosely branched; pods mostly over 15 mm. long ..... *M. dispersa* (typical).
Middle cauline leaves mostly ovate; plant densely branched; pods shorter ..... var. *compacta.*

M. albicaulis Dougl. var. **Veatchiana** (Kell.) Urb. & Gilg. Osoyoos (DA).
Petals 2-4 mm. long; leaves entire or sinuately (rarely deeply) pinnatifid ..... *M. albicaulis* (typical).
Petals 5-6 (-8) mm. long; leaves mostly deeply pinnatifid
var. *Veatchiana*

LYTHRACEAE

AMMANIA

Low glabrous annuals. Leaves opposite, sessile, narrow. Flowers small, 1-several in the axils; calyx campanulate, ovoid or globose, 4-angled, 4-toothed, and with 4 small appendages in the sinuses; petals 4, small, early deciduous or wanting; stamens 4-8. Capsule globose, enclosed in the calyx, 2-4-celled, bursting irregularly.

A. coccinea Rottb. Stems 4-angled, 5-45 cm. high, simple or branched from the base; leaves linear to lanceolate, dilated at the base, auriculate-clasping, 2-7 cm. long; fls. 1-5 in the axils of nearly all the leaves, subsessile; calyx 3-4.5 mm. long; petals pink or purplish, 3 mm. long or less, or wanting; capsule 3-5 mm. in diam. Widely distributed in N. Am.; Mexico; Brazil; muddy edges of lagoons, Osoyoos Lake (DA), apparently thriving in alkali encrustations.

LYTHRUM

L. Salicaria L. Alberni, V. I. (PM); Fry's Corner, Pacific Highway; Cloverdale; Chilliwack district.

HALORAGIDACEAE
HIPPURIS

H. montana Ledeb. Grouse and Dam Mts., N. Vancouver (J. Davidson); Black Tusk Meadows, Garibaldi (DA).
H. tetraphylla L. f. Bella Coola (PM).

MYRIOPHYLLUM

M. spicatum of Am. authors=**M. exalbescens** Fern.
M. verticillatum L. Alberni and Shawnigan L., V. I. (PM. Cat.); New Westminster (U).
M. hippuroides Nutt. Stems simple or sparingly branched, 2-6 dm. long; submerged leaves rather crowded in whorls of 4-5, dissected into filiform segments; aerial leaves linear and dentate; fls. shorter than the linear or lanceolate, serrulate or denticulate bracts; stamens 4. Wash. to Calif., mainly w. of the Cascades; Beaver L., Stanley Park, Vancouver (DA).

ONAGRACEAE
BOISDUVALLIA

B. Douglasii Spach.=**B. densiflora** (Lindl.) S. Wats.
B. stricta (A. Gray) Greene. Plants 5-50 cm. high, pilose, often canescent, stem and branches slender, erect, often flowering almost from the base; lower leaves 1-3 cm. long, linear or linear-lanceolate, entire or denticulate; upper leaves similar, less crowded together than in our other sp., fls. in most of the axils; calyx 2.5-3 mm. long, the lanceolate lobes longer than the tube; petals rose or purplish, 2-4 mm. long; capsule 7-12 mm. long, linear-subulate, curved, loculicidal. Ida., & Wash. to Calif. Douglas L. (PM).

CLARKIA

C. rhomboidea Dougl. is credited to B. C. by Rydberg and according to Piper was collected by Lyall, presumably near the B. C. boundary. Differs from **C. pulchella** in having the petals entire and all the 8 stamens fertile. To be looked for east of the Cascades.

EPILOBIUM

E. Drummondii Haussk. Perennial; stem simple, slender, erect, 1-4 dm. high, pale, glabrous; leaves glabrous or nearly so, 2-4 cm. long, sessile, narrowly lanceolate, repand-dentate, erect; petals white to violet, about 4 mm. long; capsule 3-5 cm. long, slender-pedicelled; seeds acute at each end, apiculate, papillate. Sask. to B. C., s. to S. D., U., and Colo. (Rydberg); also ascribed to B. C. by Piper.
E. franciscanum Barbey. Close to **E. adenocaulon** but little or not at all glandular; canescent or pilose above; petals larger, 5-10 mm. long. V. I. to Calif. Qualicum and Cowichan, V. I. (PM. Cat.).
E. glaberrimum Barbey. Perennial, glabrous and glaucous; stems 3-8 dm. high, usually simple; leaves linear to oblong-lanceolate, entire or sparingly denticulate, obtuse, 3-5 cm. long, rounded at base, sessile or nearly so, closely ascending; fls. few; calyx 4-5 mm. long, tube very short, lobes oblong; petals purple, 6-7 mm. long; capsule 4-6 cm. long on pedicels 15-20 mm. long; seeds minutely papillose. Wash. to Calif. and Nev. May occur in B. C.

var. **fastigiatum** (Nutt.) Trel. Lower, 1-3 dm. high, more slender, the stems clustered, often decumbent at base; leaves broader and shorter, narrowly ovate or lance-ovate. Range of the sp.; wet rock-face at 4500 ft., Rossland (DA).

E. oregonense Haussk. Stems stoloniferous, erect, very slender, simple, glabrous, 1-3 dm. high; leaves subsessile, somewhat crowded below, very remote above, oblong to lance-oblong or nearly linear, entire or minutely denticulate, obtuse, 8-15 mm. long; fls. usually 1-3; calyx 3.5-5 mm. long, the lobes oblong; petals pink to violet, 5-8 mm. long; capsule very slender, 25-35 mm. long, often on long filiform pedicels; seeds smooth, strongly hyaline-beaked, 1.5 mm. long. Bogs in the Cascades, chiefly at high alt., B. C. to Ore.; Ucluelet, V. I. (PM).

GAURA

Annual, biennial or perennial herbs with alternate, sessile leaves. Flowers in terminal spikes or racemes; calyx with tube prolonged beyond the ovary, the lobes reflexed; petals obovate or oblanceolate, clawed, unequal; stamens 8, the filaments bent down; ovary 4-celled, stigma 4-lobed. Fruit usually 1-celled, 1-4-seeded, scarcely dehiscent.

G. coccinea Pursh. Stem erect or ascending, branched canescent, pubescent or glabrate, 15-16 cm. high; leaves sessile, oblong, lanceolate, or linear-oblong, denticulate or entire, narrowed at the base, 10-35 mm. long, canescent; fls. sessile; petals pink to scarlet (rarely white), 4-6 mm. long; capsule 5-7 mm. long, with a stipe-like base. Man. to Mont. and s.; above the lake-beach at Windermere, Columbia Valley (DA).

LUDWIGIA

L. palustris (L) Ell. Not common; Quamichan L., V. I. (PM. Cat.); Somass River, above Alberni, V. I. (DA); Chilliwack (DA); not recorded so far from the Interior.

OENOTHERA

O. strigulosa T&G=**O. contorta** Dougl. Saanich Spit, V. I. (DA).

O. pallida Lindl. Osoyoos (DA); Kelowna (H. Groh).

O. breviflora T&G

Taraxia breviflora Nutt.

Acaulescent perennial; leaves deeply pinnatifid, 5-12 cm. long, minutely pubescent; sepals and yellow petals about 5 mm. long; stigma capitate; capsule about 15 mm. long, 4-winged, lance-ovoid, tuberculate. Alta. and B. C. to U. and Wyo. (Rydberg); Nemaia Trail, Chilco L. (PM).

UMBELLIFERAE

(Changes in nomenclature those of Mathias and Constance in North American Flora, 1946)

AEGOPODIUM

A coarse glabrous perennial herb with extensively branching, creeping rootstocks. Leaves 1-2-ternate. Bracts of involucre and involucels none, or few and early deciduous. Calyx-teeth obsolete. Petals white, inflexed at the tip. Stylopodium conic, prominent. Fruit ovate-oblong, somewhat compressed, obscurely 5-angled, ribs slender, equal, distant. Oil-tubes none.

A. Podagraria L. (Ground-elder; Goutweed; Bishop's Weed). Stems erect, branched, 5-8 dm. high; basal and lower leaves long-petioled; leaflets ovate, sharply serrulate, 3-8 cm. long; umbels long-peduncled, 3-7 cm. wide, 9-25-rayed; pedicels 4-8 cm. long; fruit about 4 mm. long, styles deflexed. Introd. from Europe; vacant lots and roadsides, Grandview, Vancouver (DA). A variegated form is often grown by incautious gardeners.

ANGELICA

A. genuflexa Nutt. extends into the Interior in the north; Smithers; Ootsa Lake; Quesnel; in DA.

A. Lyallii Wats.=**A. arguta** Nutt.

ANTHRISCUS

A. vulgaris (L.) Pers.=**A. scandicina** (Weber) Mansf. Very abundant in Nanaimo and the surrounding district and apparently extending.

BERULA

B. erecta (Huds.) Cov. appears to be rare. Henry's localities are those of Macoun's Cat., 1890. The only new record is from the Coast at Popcum, near Hope (R. Glendenning, DA).

CARUM

C. carvi L. Occasional at various places; established and spreading along irrigation ditches at Thunder Hill Ranch, Columbia Valley.

C. Gairdneri (H&A) Gray=**Perideridia Gairdneri** (H&A) Mathias.

CICUTA

C. occidentalis Greene and *C. vagans* Greene are not considered separable from **C. Douglasii** (DC) C&R by recent authors.

C. bulbifera L. Distinguished from the last by the narrower leaflets, linear to linear-lanceolate, bearing bulblets in the axils. Erect, slender, much-branched above, 3-15 dm. high; leaves 2-3-pinnate, leaflets 2-5 cm. long, sparsely but deeply serrate; uppermost less divided, often simple and linear with bulblets. Newf. to B. C., s. to Del. and Ore. Reid Lake and adjacent Mud Lake, w. of Prince George, lat. 54 (DA); no records from the south.

COELOPLEURUM

C. longipes C&R=**Angelica lucida** L. *C. Gmelini* (DC) Ledeb., recorded from n. V. I. and Q. C. I., is not considered distinct.

LIGUSTICUM

L. scoticum=**L. Hulteni** Fern. as regards the Pacific Coast plant.

L. Canbyi C&R

L. Leibergii C&R

Nearly glabrous throughout; stem 7-12 dm. high; leaves large, biternate, then pinnate, the rather narrow leaflets lanceolate and somewhat acuminate in outline and sharply cleft; involucre of a few subulate bracts; fruit 4-5 mm. long, the ribs narrowly and nearly equally winged. B. C. to w. Mont. and Wash. Common in the mts. around Kootenay L. (DA); Rossland (DA); Mt. Revelstoke (PM).

L. apiifolium (Nutt.) Gray, as now understood, is a plant of the Cascades and Coastal areas of Wash. to Calif. Henry's record of it from the Selkirks appears to be based on Macoun's Cat. (1886) and is probably **L. Canbyi.**

LOMATIUM

L. Geyeri (S. Wats.) C&R. *Root with one to several globose, ovoid or cylindrical tubers;* plant 1-5 dm. high, *glabrous,* acaulescent; leaves ternate, then 1-2-pinnate, the segments linear, 1-5 cm. long, 1-2 mm. wide; scapes exceeding the leaves; umbels asymmetric with 7-18 rays; involucels 1-4 mm.

long, lanceolate, more or less united; pedicels about 3 mm. long; calyx-teeth rounded, minute; *petals white;* fruit 8-13 mm. long, *glabrous,* oval; dorsal ribs filiform, the lateral winged, 1-1.5 mm. wide; oil-tubes obscure or absent. B. C., Wash. and Ida.; e. of Hope (DA); southern Okanagan (DA); Rock Creek (PM); Cranbrook (W. C. McCalla).

OSMORHIZA

O. brevipes (C&R) Suksd. and *O. divaricata* Nutt. are not considered distinct from **O. nuda** Torr. *O. Leibergii* (C&R) Blank=**O. purpurea** (C&R) Suksd. but it is doubtful if this is the plant referred to as "common on V. I.".

SANICULA

S. septentrionalis Greene=**S. nevadensis** Greene.
S. Menziesii H&A=**S. crassicaulis** Poepp.
S. marylandica L. Local, but widely distributed; Crawford Bay, Kootenay L.; Yahk; Fairmont, Columbia Valley; Quesnel; Fort Fraser; Hazelton, lat. 55½.

SCANDIX

Annual herbs with leaves pinnately dissected into small linear segments. Umbels compound, few-rayed without involucres; involucels of 2 bractlets, connate at base and lobed above. Calyx-teeth minute or absent. Petals white, the outer larger. Fruit linear, laterally compressed, with an elongated beak often much longer than the body; primary ribs prominent, secondary wanting.
S. Pecten-Veneris L. (Venus' Comb). Sparsely pubescent; stem 1-4 dm. high, branched; leaves 2-3-pinnately dissected into fine segments; primary rays 2-3; fls. nearly sessile; body of fruit 6-10 mm. long, beak 2-7 cm. long, flattened, hispid-ciliate on the margins. Introd. from Europe; Victoria (PM); Kootenay Lake (DB).

SIUM

S. cicutaefolium Schrank=**S. suave** Walt. Common throughout; Prince George and Vanderhoof, lat. 54.

ZIZIA

Z. cordata (Walt.) Koch=**Z. aptera** (Gray) Fern. Nelson (DA); Field (DA); Horsethief Creek, Columbia Valley (Ulke); McBride, lat. 53 (DA).

ERICACEAE

CALLUNA

A low, much-branched, evergreen shrub, with minute, linear, opposite, crowded and imbricate leaves. Flowers in 1-sided, terminal, spike-like racemes, each fl. with 2-3 pairs of small bracts at its base. Calyx of 4 colored sepals much exceeding and concealing the corolla. Corolla 4-parted, both calyx and corolla persistent and becoming scarious. Stamens 8, distinct; anthers with a pair of deflexed appendages on the back, the cells opening by a crack. Capsule 4-celled, 4-valved. A monotypic genus of Eurasia.
C. vulgaris (L) Hull. (Scotch Heather; Ling). 3-6 dm. high; fls. usually pink but occasionally white. Commonly cultivated; apparently well-established and spreading on peaty ground, Lulu Island, Vancouver (DA).

CASSIOPE

C. Stelleriana (Pall.) DC. Beaver Mt., Hope (F. Perry, DA).
C. tetragona (L) D. Don. Lillooet (PM); Limestone Mt., Clinton at 7500

ft. (PM); Dunn Peak, Chu-Chua, at 7500 ft. (EWT); abundant about timber-line, Horsethief Creek, Columbia Valley (Ulke); McBride, lat. 53, at 6000 ft. (DA).

CHIMAPHILA

C. Menziesii (R. Br.) Spreng. Given only from the Coast in Henry but ranges east to Ida. Ainsworth and Kootenay Bay, Kootenay Lake (DA).

CHIOGENES

C. hispidula (L) T&G. Reid L., Prince George (DA); Smithers, lat. 54½ (DA).

GAULTHERIA

G. Shallon Pursh, while mainly a Coast sp., occurs fairly plentifully at several points on Kootenay Lake; Riondel (U); Gray Creek and Kootenay Bay (DA).

G. ovatifolia Gray is common in the mts. around Kootenay Lake.

PYROLA

P. aphylla Smith. Gray Creek, Kootenay L. (DA).

VACCINIUM

V. deliciosum Piper. A low bush, 5-30 cm. high; twigs slightly angled; leaves obovate to oblanceolate, 2-4 cm. long, denticulate, thickish, glaucous, usually obtuse or rounded at apex; calyx-lobes obsolete; corolla nearly globose, white or pinkish; pedicels 3-6 mm. long, decurved; berry 3-6 mm. in diam., deep blue with a bloom. Cascade and Coast ranges, Wash. and Ore. Forbidden Plateau, V. I. (PM); Mt. Arrowsmith, V. I. (PM); Strathcona Park, V. I. (PM. Cat.).

MONOTROPACEAE
PLEURICOSPORA

White or yellowish fleshy plants with fringed scale-like leaves. Flowers crowded in a dense spike; sepals 4-5; petals 4-5, similar to the sepals, fringed; stamens 8 or 10, filaments flattened, anthers linear, opening along their whole length; ovary 1-celled, style short, stigma somewhat funnel-shaped.

P. fimbriolata Gray. Erect, 5-20 cm. high, white or brownish-tinged, glabrous; leaves ovate, often acuminate, erose or fimbriate; racemes dense, bracts similar to the leaves, often more strongly fringed; fls. 12-15 mm. long; sepals and petals variable, mostly whitish, rarely deep red, more or less fimbriate; fruit white, turning dark bluish. Wash. to Calif. Beaufort Range above Horne Lake, V. I. (PM. Cat.).

PTEROSPORA

P. andromedea Nutt. Not common but widely distributed; Allenby Aspen Grove; Penticton; Crawford Bay, Kootenay L.; Bridge River.

PRIMULACEAE
ANDROSACE

A. diffusa Small and **A. septentrionalis** L. are common across the Chilcotin from Redstone to Chilco L. The former has also been collected on Mt. Arrowsmith, V. I. (W. Newton, PM) and Ootsa Lake, lat. 53 (PM).

A. occidentalis Nutt. distinguished from **A. diffusa** by the involucral bracts being ovate to oblong, obtuse, about 5 mm. long, while in **A. diffusa**

they are subulate, 2-3 mm. long. Kamloops (U); Lillooet (PM); Armstrong (U).

CENTUNCULUS

C. minimus L.; near Victoria (PM); Sproat L.; Sidney (PM. Cat.); Nanaimo (DA); Alberni (DA); all on V. I.

DODECATHEON

D. dentatum Hook. Sparingly along a stream at 4000 ft. in the southern Okanagan (DA).

D. Jeffreyi Van Houtte (*D. viviparum* Greene). Forbidden Plateau, V. I. (PM); Prince Rupert (PM); Q. C. I. (PM. Cat.).

D. tetrandrum Suksd. Forbidden Plateau, V. I. (U).

DOUGLASIA

D. laevigata Gray. Caespitose, the caudices 5-10 cm. long; stems slender, spreading or depressed, 2-4 cm. long; leaves crowded at the summit, nearly glabrous, linear-oblong, oblanceolate or spatulate, usually obtuse, 8-12 mm. long; peduncles filiform, 2-7 cm. long, scurfy-puberulent; umbels 2-6-fld., the pedicels usually shorter than the calyx; calyx 4-5 mm. high, lobes ovate, acute; corolla rose to crimson, tube longer than the calyx, inflated above, throat contracted, lobes spreading, nearly half as long as the tube. Wash. and Ore. var. **ciliolata** Const. Leaves broader, usually ciliolate, thinner; peduncles longer, pedicels shorter; fls. larger and more numerous. Range of the sp. Strathcona Park, V. I. (PM).

OLEACEAE

Shrubs or trees. Leaves usually opposite, simple or pinnate, exstipulate. Flowers perfect, polygamous, or dioecious; calyx free from the ovary, 2-4-cleft, sometimes absent; petals free, united, or absent; stamens 2-4, on the corolla or receptacle; ovary 2-celled, ovules few. Fruit a capsule, samara, berry or drupe, often 1-seeded by suppression of one carpel.

FRAXINUS

Trees with pinnate leaves. Flowers in dense panicles, dioecious, monoecious, or perfect; calyx small, entire or toothed, or absent; petals 2-4 or none; stamens usually 2, the anthers linear and relatively large; fruit a flat samara, usually 1-seeded.

F. oregana Nutt. A tree 10-18 m. high and 5-8 dm. in diam.; leaflets 5-7, more or less pubescent beneath, elliptic-oblong, mostly acuminate, 6-12 cm. long; fls. appearing before the leaves; samaras oblanceolate, 35-45 mm. long. West of the Cascades, B. C. to Calif. (Peck); occurs on southern V. I. but doubtfully native.

GENTIANACEAE

CENTAURIUM

C. exaltatum (Griseb.) Wight. Erect, strict, 8-40 cm. high, simple or branched; leaves few, oblong or lanceolate, mostly acute, 15-25 mm. long; fls. 12-18 mm. long, terminal on the branches, *all long-pedicelled*; sepals linear-lanceolate, equalling or a little shorter than the corolla-tube; limb of corolla campanulate, pink or light red, the lobes less than half as long as the tube; capsule narrowly oblong, distending the persistent scarious corolla-tube. East of the Cascades, Wash. to Calif. and Neb.; abundant around a saline pond, Osoyoos (DA).

C. umbellatum Gilib.
C. Centaurium (L.) Wight
Erythraea Centaurium (L.) Pers.

Stems erect, strict, 1-4 dm. high, simple or branched; *leaves crowded in a basal rosette,* obovate, *strongly 3-nerved;* infl. dense, terminal on the branches; fls. 10-13 mm. long; sepals about half as long as the corolla-tube, unequal; limb of corolla bright red, throat yellow, lobes obtuse, about half as long as the tube. Introd. from Europe; Victoria (PM).

GENTIANA

G. affinis Griseb. Cranbrook (PM).

G. americana Engelm. Churn Creek, Chilcotin (PM); Paradise Mine, Windermere (PM).

G. Douglasiana Bong. Ucluelet and Wreck Bay, V. I. (PM); Ocean Falls (DA); Princess Royal Is. (DA).

G. elegans A. Nels. Stem 2-3 dm. high, angled, usually branched from near the base; basal leaves spatulate, obovate or oblanceolate, 1-3 cm. long, obtuse; stem-leaves sessile, oblong to lanceolate, 2-4 cm. long; *fls. 4-merous* on long naked peduncles; calyx angled, green with purple spots, tube 10-15 mm. long, lobes 8-15 mm. long, lanceolate, acuminate, the inner broader; *corolla 3-5 cm. long without plaits or lobes in the sinuses,* bluish to purple, veined; lobes obovate-oblong, *dentate above, fimbriate on the sides;* filaments broadly winged, naked. Mack. to Ida., Colo. and Ariz. Field, "very rare" (Ulke).

G. Macounii Holm. Differs from the above in the linear stem-leaves; inner calyx-lobes ovate, fully twice as broad as the outer linear-lanceolate ones; filaments hairy at the middle. James Bay-Alta.-Mont.-B. C. (Rydberg). Golden (A. J. Breitung).

G. propinqua Richards. Cameron L., V. I. (PM); Mt. McLean, Lillooet (PM).

APOCYNACEAE
APOCYNUM

Henry's treatment of **A. androsaemifolium** and its allies is inadequate, and the following is substituted.

A. Corolla about 3 times as long as the calyx.
  B. Corolla 6-10 mm. long; base of the tube less than half width of limb; lobes reflexed ..... *A. androsaemifolium* L.
  (a) underside of leaves finely tomentose ..... var. *incanum* DC.
  BB. Corolla 4-8 mm. long; base of tube more than half width of limb; lobes spreading to nearly erect ..... *A. pumilum* (Gray) Greene.
AA. Corolla 4-5 mm. long, about twice as long as the calyx, lobes somewhat spreading ..... *A. medium* Greene.
(a) plant glabrous throughout ..... var. *floribundum* (Greene) Woods.

All the above occur but typical **A. androsaemifolium** appears to be much the commonest form. Fort Fraser, lat 54 (DA).

CONVOLVULACEAE
CONVOLVULUS

C. Sepium L. is now a rapidly spreading weed of vacant lots and waste ground in Victoria and Vancouver; Nelson (DA).

C. Soldanella L. Saanich Spit, V. I. (DA); Pachena Bay, V. I. (PM. Cat.); Clayoquot, V. I. (PM. Rept. for 1924).

CUSCUTA

C. arvensis Beyr.=**C. pentagona** Engelm.

C. salina Engelm. 2 vars. connected by intermediate forms occur.

var. **squamigera** (Engelm.) Yunck., lobes of the calyx and corolla ovate-lanceolate.

var. **major** Yunck., fls. larger, more broadly campanulate, corolla lobes broadly ovate, overlapping, spreading.

C. Epithymum Murr. Distinguished from both the above by having the stigmas not capitate but filiform and longer than the style. Introd. from Europe; on Red Clover, North Vancouver (DA); Mayne Is. (PM. Cat.).

POLEMONIACEAE

Correction. In characters of the family "ovary 5-celled" should be "ovary 3-celled".

GILIA

This genus as given in Henry is usually divided into several genera but only the two following, which involve new material, are characterised here.

LEPTODACTYLON

Stems woody, at least at the base. Leaves palmately parted to the base into linear or subulate, often rigid and spinous divisions, the primary leaves with fascicles of secondary leaves in their axils. Flowers rather large, solitary or in terminal clusters; calyx with subulate lobes; corolla trumpet-shaped, the throat narrowly funnel-form. Capsule few- or many-seeded, rupturing the calyx-tube.

L. pungens (Torr.) Nutt.

G. pungens (Torr.) Benth.

A dwarf, rigid, freely-branched shrub, 1-2 dm. high, glandular-tomentose above; leaves very numerous, crowded to the summit, alternate or the lower opposite, 3-5-parted, with straight, subulate, pungent divisions 4-12 mm. long; fls. axillary and sessile or in congested leafy terminal clusters; calyx 5-7 mm. long, scarious below the sinuses, the pungent lobes less than half as long as the tube; corolla pink, yellowish or white, the tube 8-15 mm. long, lobes 7-10 mm., obovate, spreading; capsule oblong, about 2.5 mm. long, many-seeded. Dry places e. of the Cascades, B. C. to Calif. and Colo. (Peck).

var. **Hookeri** (Benth.) Jeps. Larger, up to 5 dm. high, not depressed and matted, the upper branches mostly straight and stiffly erect; leaves mostly squarrose. B. C. to Calif. Summerland south to the Boundary (DA).

LINANTHUS

Low annuals with opposite leaves palmately parted to the base into very narrow segments, rarely only lobed or entire. Flowers paniculate or in dense terminal clusters; calyx-tube usually scarious below the sinuses, the lobes equal; corolla campanulate, funnel-form or salver-form, small or relatively large and showy; stamens borne at the same level in the corolla-tube. Capsule with 3 to many seeds in each cell.

G. bicolor (Nutt.) Piper (*G. tenella* Benth.)=**L. bicolor** (Nutt.) Greene.

L. Harknessii Curran. Nicola (PM); Toad Mt., Nelson (DA); both at ca. 6000 ft. Henry's description of *G. pharnaceoides* fits this sp. better, and recent publications give *G. pharnaceoides* only from s. Ore. and Calif.

L. septentrionalis Mason, a recently described sp. credited to B. C.

Corolla-tube more than 4 times as long as the lobes ..... *L. bicolor*

Corolla-tube not more than twice as long as the lobes.
Seeds 1 to each cell of the ovary; corolla glabrous within, barely exserted from the calyx; filaments glabrous ..... *L. Harknessii*
Seeds several to each cell of ovary; corolla rarely glabrous within, usually with a hairy ring at or above the stamen insertion, or base of filaments hairy.
Corolla 2-4 mm. long, 1½-2 times the calyx; hairs dense to sparse in a ring on the throat of corolla, rarely absent; filaments glabrous or with a few hairs ..... *L. septentrionalis*
Corolla 6-10 mm. long, 3-5 times as long as the calyx; hairs dense, on the base of the filaments only ..... *L. pharnaceoides*

PHLOX

P. rigida Benth. Windermere, Columbia Valley (U); near Wardner (DA).

P. speciosa Pursh. Dog Lake, Penticton (DA); locally plentiful in Twin Lakes Valley, s.w. of Kaleden (DA).

P. diffusa Benth. subsp. **longistylis** Wherry. Differs from the typical form in somewhat lower stature; smaller leaves and fls.; especially in the longer styles, 6-12 mm. long as against 3-5. B. C. to Ore.

POLEMONIUM

P. coeruleum L. is a European sp. often grown in gardens; the native sp. formerly referred to it is **P. occidentale** Greene; Monashee Pass (PM); Six Mile Lakes, Nelson, at 4000 ft. (DA); Ootsa Lake (PM).

P. humile, so far as our area is concerned, appears to be mainly, if not entirely, **P. pulcherrima** Hook. Widely distributed e. of the Cascades.

P. acutiflorum Willd. Stems 3-6 dm. high; basal leaves usually withered at fl. time; stem-leaves few, leaflets 11-23, lanceolate to lance-ovate, 7-15 mm. long; corolla 15-20 mm. wide, dull blue changing to purple in drying, lobes mostly acute, slightly puberulent, *sparingly ciliolate at the edges.* An arctic sp. of e. Asia and w. N. Am.; abundant in a swampy meadow just s. of Topley Landing, Babine L. (DA); Anahim L., Chilcotin, lat. 52 (DA).

P. elegans Greene. Viscid-pubescent throughout; stems slender, clustered, *5-12 cm. high;* basal leaves, including petioles, 3-6 cm. long, leaflets 15-21, *4-8 mm. long, broadly oblong to nearly orbicular,* cauline few and shorter; fls. in small, rather dense clusters; calyx about 5 mm. long, the ovate lobes equalling the tube; corolla violet with a yellow tube and throat, *7-9 mm. long,* tube shorter than the calyx, the limb cleft to the throat; capsule a little longer than the calyx-tube. High alt. in the Cascades, Wash. to Calif.; given in PM Cat. from Duncan, V. I. and Q. C. I.

P. viscosum Nutt. Mt. President, Yoho, "very rare" (Ulke).
Stems 5-10 cm. high; leaflets 1-4 mm. long; corolla 15-20 mm. long; infl. spicate or subcapitate ..... *P. viscosum.*
Stems 10-20 cm. high; leaflets 2-10 mm. long; corolla 18-30 mm. long; infl. densely capitate ..... *P. confertum.*

HYDOPHYLLACEAE
HYDROPHYLLUM

H. albifrons Heller. Mts. above Lytton (PM).

H. capitatum Dougl. Mts. above Lytton; Mt. Apex, Penticton; abundant along highway betw. Cascade and Rossland especially near summit.

NEMOPHILA

N. breviflora Gray. Lundbom Common, Nicola (GVC); Mt. Brent, Penticton (DA); Toad Mt., Nelson, at 6000 ft. (DA).

N. pedunculata Dougl. Victoria (PM); Nanoose, V. I. (PM).

PHACELIA

P. Menziesii (R. Br.) Torr.=**P. linearis** (Pursh) Holz.

P. alpina Rydb. Close to **P. heterophylla.** *Stems 2 dm. high or less,* slender, sparingly greyish-strigose and hirsute; basal leaves short-petioled, about 5 cm. long, oblong-lanceolate, or oblanceolate, *entire,* greyish-strigose; calyx hispid, *about one-half as long as corolla,* lobes linear, obtuse or acutish; corolla 5-6 mm. long, lilac; filaments bearded. Mont.-Wyo.-U.-B. C. (Rydberg).

P. Franklinii (R. Br.) Gray. *Annual,* villous-pubescent; stem erect, 2-6 dm. high, simple or branched, stout; leaves 25-75 mm. long, *pinnately parted into many lanceolate or oblong-linear segments, often dentate or incised;* racemes short, dense, crowded; pedicels short; calyx-lobes linear-lanceolate, longer than the tube of the rotate-campanulate corolla; corolla blue or almost white, with 2 appendages at the base of each lobe; stamens slightly exserted; *ovules many on each placenta; capsule ovoid, acute.* Hudson Bay and Mackenzie to Ida. and Wyo. Eliguck L. (Macoun's Cat.); s.w. of Redstone (DA); both in n.w. Chilcotin.

P. idahoensis Henderson

P. ciliosa Rydb.

Close to **P. sericea** from which it differs in having leaves green, sparingly pubescent or strigose, 3-15 cm. long, the lobes broad, oblong; plant up to 45 cm. high, villous-hirsute to strigose. Alta. and B. C., s. to Colo. and Nev. Creston; Big Ck., Cariboo; Chilcotin; all PM.

BORAGINACEAE

ALLOCARYA

This genus is reduced by recent authors to a section of **Plagiobothrys.**

A. californica (DC) Greene is strictly Californian; the common sp. on V. I. is **P. medius** (Piper) Johnst.

A. Chorisiana (Cham.) Greene is also strictly Californian.

A. plebeia (Cham.) Greene is an Alaskan sp. which may reach northern B. C.

A. Scouleri (H&A) Greene=**P. Scouleri** (H&A) Johnst.

ASPERUGO

A. procumbens L. Armstrong (DA); Penticton (PM).

CRYPTANTHA

(Most authors spell this with a terminal "a" as above)

Oreocarya leucophaea (Dougl.) Greene=**C. leucophaea** (Dougl.) Pays.

Piptocalyx circumscissus (H&A) Torr.=**C. circumscissa** (H&A) Johnst.

C. affinis (A. Gray) Greene. Anarchist Mt., Osoyoos (PM).

C. Torreyana (A. Gray) Greene. Annual; stems one to several, 1-4 dm. high, usually branched, nearly erect to spreading, hispid and also with a short appressed pubescence; leaves oblanceolate to linear, 2-7 cm. long, 3-8 mm. wide, obtuse or rounded, hispid; spikes many, usually in pairs, naked, short; corolla about 1 mm. wide; fruiting calyx 2-7 mm. long, asymmetrical, lobes lanceolate to linear, midrib hispid-hirsute, margins hispid-strigose; nutlets 1.5-2.5 mm. long, margins rounded, smooth and shining,

usually mottled, the ventral groove closed and forked below. Alaska to Calif.; frequent in the southern Interior, Lytton to Grand Forks.

C. ambigua (A. Gray) Greene. Resembling the last but leaves narrowly to broadly linear, 1-4 cm. long; spikes usually solitary and not sharply differentiated from the leafy peduncular stems; nutlets 1.5-2 mm. long, granulate and coarsely warted. B. C.-Mont.-Wyo.-U.-Calif. (Rydberg); normally a plant from east of the Cascades but our only record is from Nanaimo, V. I. (PM. Cat.); also given by Muenscher from three stations in adjacent Whatcom Co. Wash.

CYNOGLOSSUM

C. boreale Fern. More frequent in the north; Quesnel; Prince George; Vanderhoof.

C. officinale L. (Hound's Tongue). A coarse biennial weed, 4-10 dm. high, softly hairy or tomentose throughout; leaves 8-20 cm. long, the lower broadly lanceolate to oblong or oblanceolate, slender-petioled, upper lance-oblong, sessile and clasping; racemes many, from the upper axils; pedicels 5-12 mm. long; corolla reddish-purple, about 8 mm. wide; nutlets forming a low 4-sided pyramid about 1 cm. wide, very spiny, the upper surface flattened. Introd. from Europe. Abundant around Bridesville and descending along stream-beds to Osoyoos (DA); Keremeos (PM).

ECHIUM

Biennial or perennial, mostly bristly-hispid herbs, with alternate leaves and rather large blue-violet flowers in leafy-bracted scorpioid spikes. Calyx 5-parted, the segments narrow. Corolla tubular-funnelform, irregular, the limb unequally 5-lobed, the lobes rounded, spreading, the throat not appendaged. Stamens 5, unequal, at least the longer ones exserted; filaments dilated at the base. Nutlets 4, erect, ovoid, rugose, attached by the base to the flat receptacle, the scar of attachment not concave.

E. vulgare L. (Viper's Bugloss; Blue-Weed). Stem erect, branched, 3-9 dm. high; stem-leaves linear-lanceolate, sessile; fls. bright blue to violet or purplish, 15-25 mm. long, in numerous short 1-sided spikes; limb of corolla oblique, the lobes very unequal. Introd. from Europe; apparently established at Nicola, Nakusp, and Canoe Creek, Cariboo.

HACKELIA

Biennial or perennial. Inflorescence naked or rarely sparsely bracteate, pedicels recurved or deflexed in fruit. Gynobase pyramidal, broader than high. Included in *Lappula* by Henry.

L. diffusa (Lehm.) Greene=**H. diffusa** (Lehm.) Johnst. Botanie, Cranbrook, and Chilcotin in PM. The typical form has a white corolla; the blue-fld. form, which seems commoner with us, is var. **coerulescens** (Rydb.) Johnst.

L. floribunda (Lehm.) Greene=**H. floribundum** (Lehm.) Johnst. Merritt (DA); Kokanee, Kootenay Lake (DA).

L. hispida (Gray) Greene=**H. hispida** (Gray) Johnst. Occurrence in B. C. doubtful; recent works give the range as s.e. Wash. and adjacent Ore.

H. americana (Gray) Fern.

L. americana (Gray) Rydb.

Biennial; stems 3-10 dm. high, retrorsely hirsute; lower leaves petioled; blades oblanceolate, acute, 5-10 cm. long, sparingly hirsute, thin; upper ones sessile, lanceolate, acute or acuminate; corolla pale blue, 1.5-2 mm. wide; back of nutlet convex but not keeled, muricate, with usually a few prickles. Man.-Neb.-Ida.-B. C. (Rydberg).

LAPPULA

L. occidentalis (S. Wats.) Rydb.=**L. Redowski** (Hornem.) Greene.
L. cupulata (Gray) Rydb.=**L. Redowski** var. **desertorum** (Greene) Johnst.

L. brachystyla (Gray) Macbr. Annual, slender, erect, villous and appressed strigillose, sparingly branched, about 2 dm. high; leaves oblong, 8-12 mm. long, the radical ones narrowed into a petiole, the others sessile; racemes leafy-bracted; fruiting pedicels shorter than the calyx; corolla small; style short, not longer than the nutlets; nutlets tuberculate, convex on the dorsal face, scarcely 2 mm. long, the inflexed margin with fine barbed prickles, or these obsolete.

Known only from the type collected at Spence's Bridge by Dr. James Fletcher 29 May 1885. It would seem that the only specimens are in the Gray Herbarium as Dr. Senn informs me there is none in Fletcher's herbarium, now in DB. Gray originally described the plant as var. *brachystylum* of *Echinospermum brachycentrum* Ledeb., a Siberian sp. J. F. Macbride, who raised it to a sp., agrees that it is most closely related to certain Asiatic sp. but states that it differs from all the Asian forms in the short style. It is also said to be "very distinct among the American representatives of the genus". (I. M. Johnstone).

LITHOSPERMUM

L. angustifolium Michx. and *L. linearifolium* Goldie=**L. incisum** Lehm.
L. pilosum Nutt.=**L. ruderale** Dougl. The commonest sp. of the Interior.

MERTENSIA

It is doubtful if *M. oblongifolia* (Nutt.) Don ranges as far north as B. C.; the common form in the Interior is **M. longiflora** Greene. (*M. Horneri* Piper is doubtfully distinct from this).

Root not tuber-like; edge of calyx-lobes with long cilia; corolla-tube less than twice as long as the limb ..... *M. oblongifolia*
Root tuber-like; edge of calyx-lobes scabrous or with short cilia; corolla-tube 2½ to 3 times as long as the limb; leaves usually broader ..... *M. longiflora*

M. paniculata (Ait.) G. Don. The typical form, with leaves pilose beneath, is recorded from Glacier and Burgess Pass in the Selkirks but is chiefly northern; var. **borealis** (Macbr.) Williams (*M. laevigata* Piper) with leaves glabrous on both sides, or pubescent below or minutely strigillose above, is recorded from the Salmo area (L. O. Williams).

M. maritima (L) S. F. Gray. Spreading or decumbent, smooth, glaucous; leaves ovate, obovate, or spatulate, fleshy, the upper surface becoming papillose; corolla white, pink, or blue, campanulate-funnel-form, 5-7 mm. long, about twice as long as the calyx, limb 5-lobed, crested in the throat; filaments longer and narrower than the anthers; nutlets smooth, shining, fleshy, utriculate when mature. Sea-coasts of Eurasia, n.e. Am. and Alaska. Q. C. I. (PM. Cat.); collected at Nutka, V. I., by Haenke in 1791 (L. O. Williams).

MYOSOTIS

M. scorpioides L. (True Forget-Me-Not). Stems from slender rootstocks, decumbent and rooting below, 15-45 cm. high; leaves oblong-lanceolate to oblanceolate, nearly sessile; racemes loosely fld.; fruiting pedicels much longer than calyx, spreading; *calyx with hairs all straight and appressed,* the lobes deltoid, *much shorter than the tube; corolla 6-8 mm. wide.* Much like **M. laxa** but distinguished by the larger corolla and short calyx-lobes. Introd. from Europe; cultivated, but escaped and established in wet

places; Sooke, V. I.; Alberni, V. I.; Burnaby L.; Nelson; Creston; Prince Rupert.

M. sylvatica Hoffm. Annual or biennial; stems 3-6 dm. high, hirsute, often cinereous, usually branched from the base; leaves oblong-linear or oblanceolate, nearly sessile; racemes long and loosely fld.; *calyx cleft nearly to the base, most of the hairs straight and appressed, but a few at base spreading and hooked; corolla 6-8 mm. wide.* Introd. from Europe; cultivated and sometimes escaping; apparently established near Sooke, V. I.

PLAGIOBOTHRYS

P. hispidulus (Greene) Johnst. Annual; stem usually branched from the base, prostrate or ascending, 8-40 cm. long, strigose; lower leaves linear, upper linear to oblanceolate, 1-5 cm. long, appressed-hispidulous or upper surface glabrous; racemes elongated and loosely fld., leafy-bracted below; calyx densely bristly, the lobes 2-3 mm. long; corolla 1-2 mm. wide; nutlets 1.5-2 mm. long, ovate to lance-ovate, rugose, warted and finely hispidulous; scar small, linear-oblong to elliptical or narrowly obovate, lateral, suprabasal, concave. Wash. and Ida. to Calif. and e. to Wyo. Rossland (DA); Nelson (U); Creston (DA); Cranbrook (DA).

VERBENACEAE
VERBENA

V. hastata L. Penticton (DA); Osoyoos (DA); Victoria and Alberni on V. I. (PM. Cat.).

V. bracteosa Michx. Common around Grand Forks (DA).

LABIATAE
AGASTACHE

A. foeniculum (Pursh) Ktze. Prince George, lat. 54 (DA).

A. urticifolia (Benth.) Rydb. Okanagan Falls (GVC); common along highway from Cascade to Rossland (DA).

For ERIGANUM read ORIGANUM
GALEOPSIS

G. Tetrahit L. Becoming general; Fraser Valley; Gray Creek, Kootenay L.; Revelstoke; McBride; Smithers, lat. 54½.

LAMIUM

L. amplexicaule L. Becoming more frequent; Victoria district of V. I.; Agassiz; Summerland; Mirror L. and Gray Ck., Kootenay L.; Quesnel.

L. maculatum L. (Spotted Dead-Nettle). Perennial; stems 2-4 dm. high, decumbent and rooting; leaves all petioled, broadly ovate, truncate or cordate at base, 2-5 cm. long, coarsely crenate, usually with a whitish blotch along the midrib; fls. in small clusters in the upper axils; corolla purplish-red, 20-25 mm. long. Introd. from Europe; an occasional garden escape around Vancouver.

L. purpureum L. Annual; usually branched from the base, 10-25 cm. high, nearly glabrous; leaves 15-30 mm. long, coarsely crenate, mostly crowded near the summit, the lower long-petioled, the uppermost reduced and purplish; corolla 10-15 mm. long, purplish, spotted with deeper color. Introd. from Europe; apparently established among rocks at Point Atkinson, Vancouver.

MENTHA

M. arvensis L. var. **canadensis** (L) Briq. (*M. canadensis* L.); our commonest form. var. **glabrata** (Benth.) Fern; more slender and simple;

nearly glabrous except the puberulent angles of the stem and the infl. var. **lanata** Piper; stems and lower surface of leaves densely pubescent or tomentose.

M. longifolia (L.) Huds. var. **mollissima** Borkh. (HORSE MINT). Stem 3-5 dm. high; leaves *sessile* or nearly so, lanceolate, ovate-lanceolate or oblong-lanceolate, apex acute, margins sharply serrate, *tomentose beneath; infl. of terminal, canescent spikes.* Introd. from Europe; forming large beds along the track and in adjoining field at Pemberton railway station (DA).

PHYSOSTEGIA

P. parviflora Nutt. Widely distributed east of the Cascades to Vanderhoof and Prince George, lat. 54.; also reported from the Lower Fraser Valley in the Coast region.

SCUTELLARIA

S. galericulata of Am. authors, not L.=**S. epilobiifolia** Hamilton.

TEUCRIUM

T. occidentale Gray. Kamloops (DA); Richter Pass, s. Okanagan (DA).

THYMUS

Low perennials with small, entire, strongly veined leaves. Flowers white to purplish; calyx 13-nerved pubescent in the throat, 2-lipped, the upper 3-toothed, the lower 2-toothed; corolla small, the upper lip nearly flat, the lower spreading and 3-cleft; stamens not in pairs, usually exserted.

T. Serpyllum L. (CREEPING THYME). Stems clustered, procumbent or prostrate, woody below, finely puberulent, 2-4 dm. long; leaves broadly to narrowly ovate, glandular-puncate, 4-7 mm. long, on short, sparsely bristly petioles; fls. in crowded terminal whorls with leafy bracts; calyx 3-4 mm. long, the lips equalling the campanulate tube, the lower teeth very narrow and strongly ciliate; corolla light purplish (sometime white), 1½ times as long as the calyx. Native of Europe; commonly cultivated in rock-gardens; golf-links, Qualicum, V. I. (PM. Rept. 1924); Victoria (DB); Quick, lat. 54½ (DA).

SOLANACEAE
SOLANUM

S. Dulcamara L. Well established at several places; Sumas; Osoyoos; Horsefly, Cariboo.

S. triflorum Nutt. Penticton (DA); Hanceville, Chilcotin (DA); abundant at Cranbrook, where it is considered a weed of some importance in cultivated land.

S. rostratum Dunal. (SAND-BUR; PRICKLY NIGHTSHADE). Annual; densely stellate-pubescent with 5-8-rayed hairs, the stems and petioles armed with abundant long yellow prickles; stem branched, 3-8 dm. high; leaves 5-10 cm. long, long-petioled, pinnately 3-7-parted, the segments mostly broadly lobed; fls. racemose; corolla yellow, 2-3 cm. wide; fruiting calyx 15 mm. long, very prickly, enclosing the berry. S. D. to Tex. and Mex. Has been collected at Lulu Is., Vancouver; Salmon Arm; Armstrong; Newgate; but does not appear to have established itself anywhere.

SCROPHULARIACEAE
BARTSIA

Annual or perennial herbs, partly parasitic on roots of other plants, with opposite leaves and flowers in terminal leafy-bracted spikes. Calyx cam-

panulate or tubular, 4-toothed or 4-cleft. Corolla very irregular, tube straight or recurved, limb 2-lipped; upper lip erect, concave, entire, the margins not recurved; lower lip spreading, 3-lobed. Stamens 4, didynamous, ascending under the upper lip; anther-sacs similar, parallel. Capsule loculicidal, several to many seeded.

B. viscosa L. Annual, viscid; stem 15-45 cm. high, terete, usually simple, often flowering nearly to the base; leaves sessile, ovate to oblong-lanceolate, coarsely serrate, 8-35 mm. long; corolla 15-20 mm. long, yellow; anthers yellow, slightly bearded; capsule oblong, acute, pubescent, shorter than the calyx. Introd. from Europe; Ucluelet (U; PM); Burquitlam, J. Buckland (DA).

CASTILLEJA

6. *C. camporum* (Greenman) Howell=**C. lutea** Heller.

12. *C. oreophila* should be **C. oreopola.**

Additional Species

Bracts scarlet, bright red, or purple

C. Elmeri Fern. Close to **C. miniata** but viscid-pilose throughout and bracts crimson or rose-purple rather than scarlet. Stems simple, solitary or few, 2-3 dm. high; leaves 2.5-5 cm. long, rather crowded, ascending; lowest linear, acuminate, upper lanceolate to lance-oblong, the broader ones indistinctly 3-nerved; bracts oblong or oblong-obovate, entire or slightly lobed at the tip, 25-30 mm. long, the lowest green, uppermost colored; calyx 15-20 mm. long, a little deeper cleft before than behind, the lobes entire or laciniate; corolla 25-30 mm. long, the green-backed galea half as long as the tube; lower lip included or slightly exserted, with 3 incurved lobes about one-fourth as long as the galea. A collection from Mt. Brent, Penticton (DA) has been identified by Dr. Pennell as this sp., otherwise known only from the mts. of central Washington.

C. Henryae Penn. Stems several, 1-2 dm. high, simple, rather slender, loosely pilose near base, hirsute or loosely villous above and through the infl.; leaves gray-green, elliptic-lanceolate, acute, 15-30 mm. long, with 2-3 pairs of divaricate lanceolate-attenuate lobes, somewhat 3-ribbed, hirsute at least on the main ribs; bracts oval, similarly lobed, hirsute or short-villose, especially on the ribs, distally purple, or soon becoming grayish-green; pedicels 10-15 mm. long; calyx 10-13 mm. long, cleft midway about three-fifths its length, the lobes cleft laterally 2-3 mm. from apex, canescent-villous, distally purple or becoming green; corolla 12-15 mm. long; galea 6-7 mm. long, acute, greenish, puberulent with glabrous margins; anterior lip 2.5-3 mm. long, with low green pouch and distinct slender yellow-green lobes; stigma 0.3 mm. wide; capsule 8 mm. long. B. C. and Alta. Type from head of Besa River (Peace River district of B. C.); Manning Park, Hope-Princeton (PM).

C. hyetophila Penn. Resembles **C. miniata** but bracts obtuse or rounded at the apex; calyx more deeply cleft in the median line. Rhizomes slender, branched; stems several, 3-6 dm. high, erect or decumbent at base, simple or little branched, glabrous or slightly pilose, villous-hirsute through the infl.; leaves linear-lanceolate to lanceolate, acutish, main cauline ones 3-10 cm. long, entire, or rarely with a pair of slender lobes, 3-ribbed, finely pubescent or usually glabrate or glabrous; bracts elliptical or oval, obtuse or rounded, entire or the upper with a pair of short lateral lobes, hirsute-pubescent, tips red; calyx 15-25 mm. long, cleft medially one-third to one-half its length, the lobes cleft laterally 3-7 mm. from apex, hirsute, distally red; corolla 18-30 mm. long, galea 9-14 mm. long, acutish, green, puberulent or short-pubescent, with glabrous reddish margins, lip 1-1.5 mm. long, green, the indistinct lobes incurved. Alaska and B. C. Sidney (DA), Cowichan (DA), Alberni (DA) on V. I.; Bella Coola (Can).

C. lauta A. Nels. Stems clustered, 2-4 dm. high, erect, simple, puberulent or nearly glabrous to the infl.; leaves lanceolate, entire, 2.5-6 cm. long, glabrous; infl. loosely villous; bracts broadly lanceolate to oblong, the lower entire, the upper with a pair of small lobes, mostly shorter than the fls., *purple at the tips;* calyx 17-21 mm. long, cleft nearly half-way, the teeth long and narrow; *corolla 15-22 mm. long,* galea a little shorter than the tube, the lower lip one-fourth as long, scarcely saccate. Mont. to Ore., U., and Colo. Yoho (Ulke); Horsethief Ck., Columbia Valley (Ulke).

C. linearifolia Benth. Stems clustered, 3-6 dm. high, erect, often branched, nearly glabrous and somewhat glaucous above, often villous below; *leaves narrowly linear,* entire or with a pair of filiform lobes, spreading, 5-8 cm. long; spike dense, becoming 8-16 cm. long, puberulent or villous and often glandular; bracts (often much) shorter than the fls., the lower mainly green with a pair of long narrow lobes, the upper scarlet with 2-3 pairs of short lobes or teeth; calyx 25-35 mm. long, *much more deeply cleft in front than behind,* the teeth long and narrow; *corolla 35-50 mm. long,* greenish, the narrow, curved galea margined with scarlet, about equalling the tube, the lower lip well exserted, with lobes 2 mm. long. Wyo.-N.M.-Ariz.-Calif.-B. C. (Rydberg).

C. remota Greene. Related to **C. angustifolia.** Stems erect, 3-6 dm. high, rather sparsely leafy and the *fls. very loosely spicate;* margins of leaves and bracts sparingly hirsute-ciliate, other pubescence short and scanty; leaves broadly oblong, somewhat digitately cleft at or near the tip, the body quite entire; *fls. 2 cm. apart or more,* bracts similar to the leaves, the tips or whole upper part scarlet; *calyx only slightly cleft into 4 subequal oblong-obovate obtuse lobes,* these scarlet-tipped; corolla exserted from the calyx by about half the length of the galea. Type from Goldstream, V. I.; Nanaimo Lake, V. I. (DA); Mt. Brent, Penticton (DA).

Bracts greenish, yellowish or brownish
(May be reddish-tinged in C. Bennittii and C. occidentalis)

C. Bennittii Nels. & Macbr. Stems 2-3 dm. high, hirsutulous; leaves linear, *entire* or sometimes irregularly narrow-lobed; infl. dense; *bracts green, tinged with rose, 3-cleft with blunt lobes,* the middle broader; calyx 15-20 mm. long, the divisions shallowly round-lobed; corolla 15-20 mm. long, galea 6-7 mm. long, lower lip half as long, with short teeth. Idaho; Fairmont, Columbia Valley (PM).

C. cervina Greenm. Stems 5-7 dm. high, finely puberulent; leaves narrowly linear, entire or more often 3-5-parted with narrow, spreading, linear divisions, puberulent; bracts laciniately 3-5-lobed, *tipped with yellow;* calyx 15-20 mm. long, *much more deeply cleft in front than behind;* corolla 20-25 mm. long, galea about 6 mm. long, *lower lip about half as long.* B. C. and Wash. Type from Lower Arrow L.; Penticton (DA); Cascade (DA); Columbia Valley (DA).

C. flava S. Wats. Stems puberulent and more or less villous-hirsute, especially below, 3-5 dm. high; leaves narrowly linear, entire or dissected into a few linear lobes, finely puberulent; bracts yellowish, *3-cleft with linear divisions,* puberulent or villous-ciliate; calyx about 15 mm. long, *much more deeply cleft in front than behind;* corolla 20-25 mm. long, yellow, galea *8-10 mm. long, lower lip scarcely 2 mm. long,* greenish. B. C. to Mont., s. to Colo. and U. Fairmont (PM); Horsethief Ck. (Ulke); both in Columbia Valley.

C. occidentalis Torr. Stems puberulent below, villous above, 15-40 cm. high; leaves linear or linear-lanceolate, 15-40 mm. long, puberulent or somewhat villous; *bracts ovate, entire or toothed, from brownish crimson to greenish-yellow,* villous with white or yellowish hairs; calyx about 15 mm. long, villous; corolla about 18 mm. long, usually *dark-brownish or greenish-*

purple, galea 8 mm. long, lower lip about 4 mm. B. C. and Alta. to U. and Colo. (Rydberg). Yoho (Ulke); Columbia Valley-Horsethief Ck. (Ulke); Paradise Mine (PM).

C. pallescens (Nutt.) Greene. Stems clustered, ascending, *1-2 dm. high,* finely canescent-puberulent; leaves narrowly linear, entire or some with a pair of narrowly linear lobes, 2-3 mm. long, puberulent; bracts 3-5-cleft, broader than the leaves, yellowish or brownish tinged; calyx 18-20 mm. long, the lobes short, *triangular-ovate,* much less deeply cleft laterally than medially, and about equally in front and behind; corolla a little longer than the calyx; *galea 4-5 mm. long, lower lip 3-4 mm. long, somewhat inflated,* scarcely exserted. B. C. to Mont. s. to Ore. and Wyo. Credited to B. C. by Peck and Rydberg.

C. subcinerea Rydb. Stems 3-5 dm. high, *canescent-strigose;* leaves 3-ribbed, canescent, 5-7 cm. long, the lower entire and linear, the upper 3-cleft; bracts broadly cuneate, 5-7-cleft, *the upper tinged with yellow and brown-tipped;* calyx 25 mm. long, *about equally cleft before and behind;* corolla greenish-yellow, *galea 9 mm. long, lip 3.5 mm., slightly saccate.* Ida. and Mont.; Windermere, Columbia Valley (PM).

Inflorescence whitish (whole plant turning black in drying); plant of the Coast Mts.

C. parviflora Bong. Stems 15-35 cm. high, mostly simple; leaves 2-3 cm. long, lanceolate to oval in outline with 1-3 pairs of linear-attenuate lobes; calyx-lobes acute; lower lip of corolla one-third to one-fifth as long as galea. Alaska to Wash.; abundant in Black Tusk Meadows, Garibaldi (DA).

CHELONE

C. nemorosa Dougl.=**Pentstemon nemorosus** (Dougl.) Trautv. All our records are from V. I.

EUPHRASIA

E. americana Wettst. Differs from **E. arctica** in being taller (1-3 dm.); leaves glabrous or glabrate; corolla 6-8 mm. long, with deep purple lines and lateral lobes of lower lip strongly divergent. Newf. and Que. to Me. and N. H.; golf-links, Qualicum, V. I. (PM); Burquitlam (J. Buckland, DA).

GRATIOLA

G. virginiana of authors, not L.=**G. neglecta** Torr. Kamloops (DA); Sicamous (DA); Enderby (U).

LIMOSELLA

L. aquatica L.; banks of Somass R., Alberni, V. I. (DA; PM); Comox, V.I. (PM); edge of Fraser R., New Westminster (U); var. **tenuifolia** (Walt.) Pers., with leaves filiform and no distinction between blade and petiole, appears to be the common form.

LINARIA

L. dalmatica (L) Mill. Perennial, glabrous and glaucous; stems erect, often branched above, 3-6 dm. high; leaves 2-7 cm. long, lance-ovate to lanceolate, somewhat clasping at base; racemes many-fld.; fls. much as in **L. vulgaris** but spur twice as long, 18-23 mm. Introd. from the Balkans; well-established on hillsides above Wynndel, Creston.

L. minor (L) Desf. Annual, glandular-pubescent throughout; stems 12-20 cm. high, often branched; leaves linear to linear-spatulate, mostly obtuse, 10-30 mm. long; fls. shorter than the pedicels; calyx-lobes linear to linear-spatulate, a little shorter than the corolla; corolla blue or bluish, throat not

closed by the palate, spur stout, much shorter than body of corolla; capsule globose-ovoid. Often placed in a separate genus as *Chaenorrhinus minus* (L) Lange. Introd. from Europe; Agassiz (PM); railway track at Burnaby L. Station (DA).

MELAMPYRUM

M. lineare Lam. Not common w. of the Cascades, Garibaldi (DA); widely distributed in the Interior to Kispiox, lat. 55 (DA).

MIMULUS

M. Langsdorfii Donn=**M. guttatus** DC.

M. peduncularis Dougl. is not considered distinct from **M. floribundus** Dougl. The description given under the former name appears to be that of *M. washingtonensis* Gdgr., but it is doubtful if this ranges so far north.

ORTHOCARPUS

O. castillejoides Benth. Victoria; Sidney; Alberni; all on V. I.

O. faucibarbatus Gray. The form which occurs in the vicinity of Victoria is subsp. **albidus** Keck, distinguished from the sp. by the lower lip of the corolla being pure white, turning pink or purplish in age. As the range otherwise is from s. Ore. to n. Calif. it is probably introduced here. First collected in 1896.

O. luteus Nutt. Common in the Columbia Valley and Cariboo; Endako, lat. 54 (PM).

O. tenuifolius (Pursh) Benth. Cranbrook; Fort Steele; Flagstone.

O. erianthus Benth., distinguished from **O. faucibarbatus** by the galea being purple instead of yellowish, and the herbage pubescent, has been reported from Victoria (PM. Cat.). A sp. of s. Ore. and Calif. but occurring at Seattle, Wash.

O. purpurascens Benth. Distinguished from **O. castillejoides** by having the galea hooked at the tip and densely bearded on the back; filaments often densely pubescent. Calif. Mt. Finlayson, Victoria (PM).

PEDICULARIS

P. euphrasioides Steph.=**P. labradorica** Wirsing. McBride (U); common along highway from Topley to Topley Landing, Babine Lake (DA).

P. Langsdorfii Fisch. Stem stout, glabrous below, with numerous brown scales at the base, 7-20 cm. high; leaves pectinately pinnatifid or the radical parted into small, oblong, denticulate lobes; bracts mostly like the upper leaves; calyx-teeth usually denticulate; corolla rose or purple (rarely yellowish), 18-20 mm. long, galea somewhat falcate, longer than the lip, commonly with a slender tooth on each side below the apex; filaments all or one pair pilose above; capsule narrowly lanceolate. Arctic-alpine.

var. **arctica** (R. Br.) Polun. (*P. lanata* Willd.). Usually about 1 dm. high or less; spike conspicuously and densely lanate; galea shorter, nearly equalled by the lip, often edentulate; one pair of filaments glabrous; capsule ovate, acuminate, Q. C. I. (PM. Cat.); Mt. McLean, Lillooet (PM); Rainbow Mt., Bella Coola (DA).

P. latifolia Penn. Probably "form (a)" of **P. bracteosa** in Henry.

Calyx-lobes lance-linear, long-attenuate, longer than the tube, glandular-puberulent ..... *P. bracteosa.*

Calyx-lobes lanceolate, shorter than the tube, villous ..... *P. latifolia.*

Apparently much less common than **P. bracteosa**

P. ornithorhynca Benth. Stem erect, 10-15 cm. high; leaves pinnately parted, the narrow segments rather scattered and dentately lobed; stem naked or bearing 1-2 reduced leaves; spike short, 1-3 cm. long; corolla purple,

the beak short and conical. Alpine meadows of the Coast and Cascade Mts., B. C. and Wash.; several stations on V. I. including Mt. Arrowsmith and Forbidden Plateau (PM); on Mainland, Mt. Wood, Squamish (DA); Alta L. (PM); Mt. Waddington (PM); Tenquille L., Lillooet (PM).

PENTSTEMON

(The spelling *Penstemon* is favored in recent literature)

P. Lyallii Gray. Okanagan Landing (PM).

P. ovatus Dougl. Saanich Arm, V. I.; Vasseux L.; Keremeos; all in PM.

P. diffusus Dougl=**P. serratulus** Menz. Occurs east of the Cascades at Hudson Bay Mt., Smithers (DA); Mt. Revelstoke (PM).

Additional species

A. Corolla usually bright rose-red but may vary to violet

(forms of *P. pinetorum* may be pinkish)

P. Richardsonii Dougl. Stems numerous, often branched, somewhat woody at base, 2-8 dm. high; herbage puberulent or glabrous; stem-leaves many, 1-8 cm. long, linear-lanceolate to narrow-ovate, coarsely serrate to pinnately parted, the upper sessile; panicle 5-20 cm. long, loose, pedicels 2-13 mm. long; calyx-lobes 4-7 mm. long, lanceolate to ovate, acute; corolla wide funnelform, glandular-puberulent externally, glabrous or nearly so within; anthers round-reniform, glabrous except along line of dehiscence; sterile filament exserted, hispid-tufted; capsule 5-7 mm. long, ovoid, acute. Alta. and B. C. to Ida. and Ore. Ashnola (PM); Vasseux L. (PM); Osoyoos (DA); Similkameen (U); abundant at Mission Creek, Kelowna (L. E. Taylor).

AA. Corolla blue or violet

(May be pinkish or yellowish in *P. pinetorum*)

B. Anthers woolly

P. ellipticus Coult. & Fisch. Very close to **P. fruticosus.** Branches minutely puberulent, erect, 7-20 cm. high, from a procumbent woody base; leaves broadly elliptical or rotund, the lower short-petioled, entire or distantly serrulate, not coriaceous; calyx densely viscid-pubescent, lobes lanceolate, attenuate. Alta.-Ida.-Mont. Glacier (U); Yoho (Ulke); Horsethief Ck., Windermere (Ulke).

BB. Anthers glabrous, or ciliate along line of dehiscence

C. Corolla strongly widened at the throat

P. eriantherus Pursh. Stem herbaceous, stout, 1-4 dm. high, canescent or more or less villous, especially above; leaves entire or denticulate; basal spatulate or oblanceolate, blade 2-8 cm. long, petiole 1-3 cm.; cauline oblong or linear, entire or nearly so, grayish-puberulent and sometimes villous on the veins; infl. densely glandular-villous; calyx 1 cm. long, lobes lance-subulate; corolla 25-35 mm. long, throat long-bearded within; anthers horse-shoe shaped, dehiscing the whole length; sterile filament with long yellow hairs. N. D. to Wash., s. to Nev. Cranbrook to Briscoe, Columbia Valley.

var. **saliens** (Rydb.) Penn. Leaves sharply dentate; infl. sparingly glandular-villous; corolla 20-25 mm. long. Windermere, Columbia Valley (DA).

CC. Corolla almost cylindrical

P. albertinus Greene. Stems herbaceous, about 2 dm. high, decumbent, slightly glandular in the infl., otherwise glabrous; basal leaves usually less than 3 cm. long, with rhombic-ovate or rounded-spatulate blades; stem-leaves elliptic-ovate to elliptic-lanceolate, subsessile; calyx sparingly glandular, 3-4 mm. long, lobes ovate, acute, entire, slightly scarious-margined below; corolla light blue; anthers dehiscent for nearly their whole length,

glabrous, or ciliate along line of dehiscence; sterile filament bearded. Alta. and B. C. Sandon; Elko; Paradise Mine, Windermere; all in PM.

P. pinetorum Piper. Stems herbaceous, 3-10 dm. high, glabrous or sparingly glandular-pubescent below the infl.; basal leaves numerous, petioles 3-5 cm. long, blades 1-8 cm., ovate to broadly lanceolate, acute, base cuneate and decurrent, thick, evergreen, often purplish, mostly entire; stem-leaves 3-5 pairs, sessile, lower oblong or broadly spatulate, upper lance-ovate to ovate, 2.5-6 cm. long, acute, serrate, clasping; infl. 5-60 cm. long, thyrsoid, interrupted, clusters loose; pedicels 1-3 mm. long; calyx lobes 4-5 mm. long, ovate, acute, glandular-puberulent, narrowly scarious-margined; corolla usually blue but pinkish and yellowish forms frequent, glandular-puberulent externally, lower lip pilose in the throat; anthers-sacs 1 mm. long, widely divergent, glabrous; sterile filament yellow-hirsute at apex; capsule 4-5 mm. long, ovoid, acute. B. C.-n. Wash.-Ida.-Mont. Ashnola (PM); Sandon (PM); Cranbrook (PM); Flagstone (DA).

P. pruinosus Dougl. Pruinose-puberulent; stems mostly simple, sometimes woody at base, about 3 dm. high; leaves from ovate to oblong, 2-5 cm. long, glaucescent, the cauline mostly sessile; basal and lowest cauline and also the uppermost commonly entire, the others acutely and rigidly dentate or denticulate; infl. narrow and interrupted; peduncles and pedicels short, these and the lanceolate acuminate to attenuate calyx-lobes viscidly villous; lower lip of the deep blue corolla slightly hairy within; anthers glabrous, dehiscent along their whole length. A specimen in PM from Keremeos was det. as this by C. V. Piper; otherwise known only from central Wash.

P. virens Pennell. Stems 1-3 dm. high, glabrous; leaves glabrous, somewhat glaucous, the lower petioled, blades 2-4 cm. long, upper lanceolate or oblong, usually denticulate; calyx 4 mm. long, lobes ovate, broadly scarious-margined; corolla deep blue, 15 mm. long, lower lip slightly bearded; sterile filament yellow-bearded on the spatulate tip. Alta. to Colo. and Nev. Yoho (Ulke); Horsethief Ck., Columbia Valley (Ulke).

P. pseudohumilis Rydb. differs from the last in having the calyx 5-6 mm. long, the lobes lanceolate and only slightly scarious-margined.

P. humilis Nutt. is puberulent throughout and viscid in the infl. Both are credited to B. C. by Rydberg, but not considered distinct by Henry.

VERONICA

V. peregrina L. Our usual form, which occurs occasionally throughout, is var. **xalapensis** (HBK) Penn., distinguished from the sp. by having the stem, and often the calyx and leaves, glandular-pubescent.

V. Tournefortii Gmel.=**V. persica** Poir. Victoria (PM. Cat.); Yarrow (DA); Nelson (DA); Riondel, Kootenay L. (U).

V. Chamaedrys L. (GERMANDER SPEEDWELL). Rootstock slender, creeping; stem slender, decumbent and rooting, 5-30 cm. long with two lines of pubescence; leaves ovate or subcordate, coarsely crenate, 15-30 mm. long, lowest short-petioled, others sessile; racemes few-fld., pedicels 5-8 mm. long; calyx 3-4 mm. long, lobes linear; corolla bright blue, 6-8 mm. wide; capsule obcordate, narrowed at the base. Introd. from Europe; apparently established on the North Shore across from Vancouver (DA).

V. humifusa Dicks. Resembling **V. serpyllifolia** but plant usually larger; racemes glandular-puberulent; corolla larger, 5-9 mm. wide, deep blue. Wet places in the mts., Alaska to Calif.; also Atlantic Coast and Europe.

OROBANCHACEAE
OROBANCHE

O. Ludoviciana Nutt. Yoho (Ulke).

O. pinorum Geyer. Cowichan (R. Glendenning, PM); the only V. I. record.

O. comosum Hook. Jericho Air Station, Vancouver (DA).

LENTIBULARIACEAE
UTRICULARIA

U. minor L. Much less common than **U. vulgaris**; Somenos Lake, V. I. (PM. Cat.); Beaver Lake, Stanley Park, Vancouver (DA).

PLANTAGINACEAE
PLANTAGO

Plant scapose

P. elongata Pursh. A slender puberulent annual, subdioecious or polygamous; leaves narrowly linear, 3-10 cm. long; scapes exceeding the leaves; spikes very slender, not densely fld.; sepals about as long as the bracts, oblong and obtuse; corolla closed over the fruit; stamens 2; capsule ovoid-oblong, longer than the calyx; seeds 4, flat on both sides. Wash. to Sask., s.. to Ore. and Tex. Tranquille (E. W. Tisdale, DA); "less common than *P. Purshii*" E. W. T.

P. eriopoda Torr. Perennial from a stout rootstock; reddish-woolly among the leaf-bases; leaves thick, nearly glabrous, entire or denticulate, 3-9-ribbed, lance-oblong to elliptic, 5-25 cm. long, gradually narrowing into the petioles; scapes 15-40 cm. high, spike 2-20 cm. long, dense above, fls. perfect; sepals oblong-ovate with broad scarious margins; corolla-tube much exceeding the calyx, the lobes reflexed; stemens 4; capsule oblong-ovoid, 2-4-seeded. N. S. to Alta., s. to N. M. and Ore. Abundant in low alkaline meadows, Windermere, Columbia Valley (DA).

P. media L. Perennial from a short rootstock clothed with brown hairs among the leaf-bases; leaves spreading, ovate, broadly oblong, or elliptic, obtuse or acute, entire or dentate, densely and finely canescent, 5-7-ribbed, narrowed at the base into margined, usually short, petioles; scape slender, 3-6 dm. high; spike very dense, 2.5-8 cm. long; fls. perfect; sepals distinct, with broad scarious margins; stamens 4, pink or purple; capsule oblong, obtuse, about as long as the calyx, 2-4-seeded, the seeds flat or slightly concave. Introd. from Europe; Chilliwack (H. Groh, U); Revelstoke (H. Groh).

Stem leafy, often branched

P. indica L. A pubescent, somewhat viscid annual; stem slender 15-40 cm. high; leaves opposite or whorled, narrowly linear, entire, sessile, 2-8 cm. long; peduncles axillary, often umbellate at ends of stem and branches; fls. in conic, oval, or subglobose heads 1-2 cm. long. Quite unlike any other sp. in our area. One of the Old World sp. whose seeds are used medicinally under the name "Psyllium". May be expected as a casual in waste places; Vancouver (DA); Sicamous (DA).

RUBIACEAE
GALIUM

G. bifolium S. Wats. Silver King Mine, Nelson, alt. 6000 ft. (DA).

G. Mollugo L. (Wild Madder). Caespitose, forming dense patches; stems spreading, decumbent or ascending, 2-9 dm. high, glabrous and shining, smooth on the angles; internodes long; leaves in whorls of 6-8, lance-oblong or oblanceolate, tips cuspidate, margins scabrous-ciliate; corolla about 2 mm. wide; fruit glabrous. Introd. from Europe. Victoria (DB); abundant in a field of *Lotus corniculatus* at Matsqui (DA).

SHERARDIA

Slender annual procumbent or diffuse herbs with whorled spiny-pointed leaves and nearly sessile pink or blue flowers in terminal and axillary in-

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volucrate heads. Calyx-tube ovoid, the limb with 4-6 lanceolate persistent lobes. Corolla funnelform, 4-5-lobed. Stamens 4-5, inserted on the corolla-tube. Ovary 2-celled; style filiform, 2-cleft at apex. Fruit dry, indehiscent, of two 1-seeded carpels separating at maturity.

S. arvensis L. (Blue Field Madder). Stems branching, diffuse, 5-25 cm. long, sparsely coarse-pubescent; leaves 5-6 in a whorl, lanceolate to ovate or obovate, 5-10 mm. long; involucre 6-8-lobed, much exceeding the fls.; corolla light blue, about 4 mm. long. Introd. from Europe; a weed of lawns, etc., Vancouver (U); Victoria and Sidney, V. I. (PM. Cat.).

CAPRIFOLIACEAE

LONICERA

L. coerulea of Am. auth., not L.=**L. caurina** Fern.

L. glaucescens Rydb. Columbia Valley-Fairmont (DA); Windermere (U); Horsethief Ck. (Ulke).

L. utahensis Wats. The common form appears to be forma **ebractulata** (Rydb.) St. J. (*L. ebractulata* Rydb.) distinguished by the lower leaf-surface and petiole being hirsute, and the leaf-margin hirsute-ciliate near the base.

SAMBUCUS

S. melanocarpa Gray. Yoho (Ulke); Nelson (DA); Sinclair Canyon (DA).

SYMPHORICARPOS

S. racemosus Michx.=**S. albus** (L) Blake; var. *pauciflorus*=**S. mollis** Nutt.

S. occidentalis Hook. Differs from the above in having thicker leaves; fls. in usually denser clusters; style and stamens exserted. Fort Steele (PM) and Wilmer (Ulke) in the Columbia Valley; Quesnel (DA).

VALERIANACEAE

VALERIANA

V. ceratophylla (Hook.) Piper=**V. edulis** Nutt.

V. sylvatica Banks=**V. septentrionalis** Rydb. Yoho (Ulke); frequent Cariboo and northwards.

VALERIANELLA

V. anomala A. Gray. Several V. I. records in PM; Vernon (U).

DIPSACACEAE

Herbs. Leaves opposite or whorled, without stipules. Flowers in dense heads, surrounded by an involucre as in *Compositae*. Calyx-tube fused with the ovary. Corolla epigynous, 2-5-lobed. Stamens 2-4, distinct, inserted on the corrolla-tube and alternate with its lobes. Fruit an achene.

DIPSACUS

Coarse prickly herbs with large opposite leaves. Flowers in dense, terminal, peduncled, oblong heads. Bracts of involucre and scales of receptacle spinulose. Flowers each with an involucel of 4 bractlets. Corolla nearly regular, limb 4-cleft. Stamens 4.

D. sylvestris Huds. (Teasel). Biennial, 1-2 m. high; leaves sessile, upper connate, crenate or irregularly toothed, prickly on the midrib, 15-30 cm. long; heads ovoid, becoming cylindric, 5-10 cm. long, the involucral bracts as long; corolla lilac, 9-15 mm. long. Introd. from Europe; occasional in the Vancouver area.

SCABIOSA

Herbs with opposite leaves, no prickles, and blue, pink, or white flowers in peduncled involucrate heads. Bracts of the involucre herbaceous, separate or slightly united at the base. Receptacle pubescent, without scales. Involucels compressed, often minutely 4-toothed. Calyx-limb 5-10-awned. Corolla-limb 4-5-cleft, oblique or 2-lipped. Stamens 4 (rarely 2). Achene more or less adnate to the involucel, crowned by the persistent calyx.

S. arvensis L. (Field Scabious). Perennial, pubescent, simple or branched, 3-9 dm. high; basal and lower leaves petioled, lanceolate, acute or acuminate, entire, lobed or pinnatifid, 5-20 cm. long; upper sessile, often deeply pinnatifid; heads long-peduncled, depressed-globose, 2-4 cm. wide; corolla lilac or bluish. Introduced from Europe. Nicola (PM); Sinkut Lake, Vanderhoof (DA); meadows at Fort Fraser (DA).

CAMPANULACEAE

CAMPANULA

C. lasiocarpa Cham. In meadows at 6000 ft. above McBride, lat. 53 (DA).

HETEROCODON

H. rariflorum Nutt.=**Specularia rariflora** (Nutt.) McVaugh. Not common; abundant along road to Athabasca Mine, Nelson (DA).

LOBELIACEAE

LOBELIA

L. Dortmanna L. Sproat L. (PM), Cameron L. (DA), and Ucluelet (PM) on V.I.; Salt Spring Is. (PM); Powell River (PM).

L. Kalmii L. Widely distributed; Shuswap L. (U); Gray Ck. (DA) and Boswell (U) on Kootenay Lake; Cranbrook (DA); Windermere (DA); Kinbasket, Big Bend Highway (DA); Williams Lake (PM).

COMPOSITAE

AGOSERIS

A. glauca var. *dasycephala* (T&G) Jeps.=**A. scorzoneraefolia** (Schrad.) Greene. Apparently much commoner than **A. glauca** from which it differs in having the involucral bracts lanate or at least villous-ciliate on the margins (glabrous or nearly so in **A. glauca**).

A. gracilenta Greene=**A. gracilens** (A. Gray) Kuntze. Alpine in the south but common at cultivation levels in lat. 54.

A. cuspidata (Pursh) D. Dietr.=*Nothocalais cuspidata* (Pursh) Greene, but it is unlikely that this occurs here. Rydberg gives the range as Wisc.-Mo.-Colo.-S. D. It appears to have been confused with **Microseris troximoides** A. Gray (*N. troximoides* Greene) a sp. common in the southern Okanagan.

AMBROSIA

A. elatior L. (*A. artemisiifolia* L.) and **A. trifida** L. are still plants of rare and scattered occurrence.

A. coronopifolia T&G (*A. psilostachya* of auth.). Perennial by rootstocks; rough-pubescent throughout; stems usually much-branched, 2-10 dm. high, stout; leaves subsessile, 3-8 cm. long, lanceolate in outline, pinnatifid, the segments linear-lanceolate, acute, entire or few-toothed; staminate racemes terminal and axillary, 2-12 cm. long; pistillate heads 1-3 in upper axils; fruit obovoid, rugose, with 4-6 tubercles lateral and tooth-like. Que. to Man. and s. Recorded by H. Groh from Matsqui and Nakusp.

ANTENNARIA

A. erigeroides Greene. Mt. Benson, V. I. (PM. Cat.).

A. lanata (Hook.) Greene. Garibaldi (U); Chu-Chua, North Thompson (DA); Keremeos (PM); mts. around Kootenay Lake (DA); Paradise Mine, Windermere (PM).

A. Macounii Greene. Garibaldi (PM).

A. pulvinata Greene. Lillooet (PM); Yoho (Ulke).

Additional Species

A. arida E. Nels. Perhaps not distinct from **A. microphylla** from which it differs in smaller size (1-2 dm. high) and bracts of pistillate heads oblong, obtuse and milky white. Anarchist Mt., Osoyoos (PM); Horsethief Creek, Columbia Valley (Ulke).

A. microphylla Rydb. Stoloniferous, leaves of stolons rhombic-spatulate, 5-15 mm. long; stem slender, strict, 2-3 dm. high; stem-leaves linear-oblong, small, those of infl. hardly reduced; heads 5-30, conglomerate, 5-6 mm. high and wide; bracts of pistillate heads linear-oblong to lanceolate, greenish straw-colored, the inner acute, those of staminate heads oval or elliptic, rounded at apex. Sask. to B. C., s. to Neb. and N. M. Nicola (GVC).

A. sedoides Greene. Stoloniferous; stem stout, 1 dm. high; leaves of rosettes spatulate, less than 1 cm. long, densely and finely tomentose on both sides; stem-leaves 2-5 mm. wide, linear or oblanceolate; heads 4-6, conglomerate, sessile; involucre 5-6 mm. high; lower part of pistillate bracts brownish or greenish, somewhat viscid; tips dirty white, oblong, obtuse or acutish. Man.-B. C.-Colo. (Rydberg); near Field (Ulke).

A. stenophylla A. Gray. Not stoloniferous; plant caespitose, white-woolly throughout; stems 6-15 cm. high, leafy throughout, base clothed with dead leaf-bases; basal and stem-leaves similar, 1-8 cm. long, linear or nearly so; staminate infl. a 4-7-headed compact cyme; involucre campanulate, glabrous; outer bracts ovate, grey-brown, inner 4-6 mm. long, lanceolate, grey-brown with a white scarious tip; pappus 3 mm. long, white, barbed, not dilated at tip; pistillate infl. of 3-5 heads in a compact cyme; involucre campanulate, brown, bracts all lanceolate, the inner 4.5-5 mm. long, pale brown at tip; pappus about 3 mm. long, white, barbellate. Wash. and Ore., e. to Nev. Creston (PM).

APLOPAPPUS

A. Bloomeri (Grey) H. M. Hall

Chrysothamnus Bloomeri Gray

A bushy shrub, 2-6 dm. high, glabrous or minutely puberulent and somewhat viscid; leaves very numerous, filiform to narrowly linear-oblanceolate, 25-40 mm. long; heads numerous, few-fld., mostly short-peduncled, 1-several to a branch; involucre narrowly campanulate, 8-10 mm. high, of broad, rigid, glandular-viscid bracts, somewhat squarrose, with scarious, woolly-ciliate margins, all but the innermost abruptly contracted to linear green appendages; rays 1-4 or absent, yellow, 8-10 mm. long; achenes appressed-pubescent or nearly glabrous; pappus tawny. East of Cascades, Wash. to Calif., e. to Nev. Westbridge (PM).

A. carthamoides (Hook.) Gray

Hoorebekia carthamoides (Hook.) Piper

Herbaceous; stems several from a stout caudex with large fleshy roots, erect or decumbent, simple, rigid, 1-3 dm. high, puberulent or glabrate; leaves thick, rigid, sharply denticulate or spinulose, puberulent or glabrate, margins scabrous, basal ones oblanceolate, 6-12 cm. long including the long petioles, cauline linear to oblanceolate or oblong, the upper clasping and grading into the involucre; heads campanulate to hemispheric, 1-4, lateral ones sessile to short-peduncled; involucre 12-20 cm. high; bracts rigid, acute, oblong to lanceolate, puberulent, more or less denticulate, the upper part

green; rays short or absent; pappus brownish. East of Cascades, B. C. to Calif. and east to the Rocky Mts. Summerland (U).

ARNICA

(Changes of nomenclature are those of Dr. B. Maguire's Monog. 1943)

1. **A. Parryi** Gray. Widely distributed; Botanie, Lytton; Mt. McLean, Lillooet; Mt. Brent, Penticton; Rossland; Hudson Bay Mt., Smithers.

2. A. *discoidea* Benth. is confined to southern Ore. and Calif.

4. *A. pumila* Rydb. is not considered distinct from **A. cordifolia** Hook.

7-8. *A. laevigata* Greene and *A. aprica* Greene are not considered distinct from **A. latifolia** Bong.

9. *A. aurantiaca* Greene=**A. Rydbergii** Greene. Mt. McLean, Lillooet (PM); Mt. Apex, Penticton (DA); Chilcotin (PM).

10. *A. louiseana* Farr does not appear to have been recorded from the B. C. side of the Rocky Mts.

11-12. A. *foliosa* Nutt.=**A. Chamissonis** Less. subsp. **foliosa** (Nutt.) Maguire. *A. columbiana* Greene is not considered distinct from this. Common in eastern and central B. C. especially in lat. 54, Smithers, etc. See also under no. 17.

15. **A. alpina** (L) Olin. Two forms may occur in B. C. The southern plant, distinguished by being 5-20 cm. high, with leaves and stem conspicuously tomentose, is subsp. **tomentosa** (Macoun) Maguire; an Alaska-Yukon form which may enter our northern limits is subsp. **attenuata** (Greene) Maguire, 15-45 cm. high, leaves and stems inconspicuously pilose.

16. *A. crocina* Greene=**A. mollis** Hook.

17. **A. Chamissonis** Less. Dr. Maguire distinguishes 3 subsp., all occurring in B. C.

A. Pilosity at base of head predominantly coarse moniliform; pappus mostly subplumose; leaves all sessile or the lowermost short-petioled, the margins mostly serrate-dentate ..... subsp. *genuina* Maguire

AA. Pilosity at base of head predominantly merely septate but not at all moniliform; pappus mostly merely barbellate; lower stem-leaves characteristically petiolate, margins entire, denticulate or occasionally somewhat dentate-serrate.

B. Plants variously pubescent but not silvery-pilose and tomentose ..... subsp. *foliosa* (Nutt.) Maguire

BB. Plants silvery-pilose and tomentose; of wet habitats in the Cascades ..... subsp. *incana* (Gray) Maguire

19. A. *Macounii* Greene is not considered distinct from **A. amplexicaulis** Nutt.

Additional Species

A. diversifolia Greene. Stems 15-40 cm. high; stem-leaves 3 (rarely 4) pairs, the blades ovate to elliptic, obtuse to truncate or subcordate at the base, glandular above and glabrate beneath, serrate-dentate, scabrid-ciliolate, middle ones longest with blades 4-8 cm. by 2.5-6 cm., mostly with winged petioles shorter than the blades, sometimes sessile, the upper little reduced; heads usually 3-5; base of head strongly glandular and somewhat pilose; achenes hispidulous and sometimes glandular; pappus subplumose, stramineous to tawny. Alaska to Calif., e. to Alta. and Mont.

A. longifolia D. C. Eaton. Stems clustered, from short matted rootstocks, 4-6 dm. high, nearly glabrous below, puberulent and minutely glandular above; stem-leaves 5-7 pairs, sessile, little reduced above, 5-15 cm. long by 15-35 mm. wide, lanceolate to lance-elliptic, entire or denticulate; heads 7-20 (35), rarely as few as 3, base densely glandular and somewhat puberulent; involucral bracts acute, the tips not pilose within; achenes tapering to the base, subglabrate or short-stipitate-glandular, or occasionally sparsely

strigose; pappus barbellate to subplumose, stramineous to tawny. Wash. to Mont., s. to Calif., Colo., and Utah. Known from just south of the Boundary so probably also in B. C.

A. sororia Greene. Close to **A. fulgens** and apparently commoner.
Involucral bracts broadly lanceolate to elliptic-oblong, obtuse or acutish, ciliolate, tips pilose within; old leaf-bases with dense tufts of long tawny hair in the axils; disc fls. with corolla-tube pilose; rhizome short ..... *A. fulgens*
Involucral bracts narrowly lanceolate, acute or acutish, scarcely ciliolate; tips sparingly or not at all pilose within; old leaf-bases without axillary tufts of hair or this scanty and whitish; corolla-tube of disc fls. glandular, not pilose; rhizome long ..... *A. sororia*

ARTEMISIA

A. canadensis in Henry appears to be **A. campestris** L. subsp. **pacifica** (Nutt.) H&C (*A. pacifica* Nutt.). Chiefly east of the Cascades.

A. longipedunculata Rud.=**A. arctica** Less.

A. frigida Willd. Given in Henry only from the Rocky Mts., but common throughout the Interior from Lytton eastwards and at least as far northwards as Hazelton, lat. 55. (Alaska, Rydberg).

A. Absinthum L. Established at many points in the Interior; abundant around Kaslo and along the Cariboo Highway, south of Quesnel.

A. heterophylla Nutt. (*A. Suksdorfii* Piper)=**A. vulgaris** L. var. **litoralis** Suksd.

A. cana Pursh. (HOARY SAGEBRUSH). A bushy-branched rounded shrub 5-12 dm. high; leaves covered with a close silvery tomentum, broadly linear or linear-oblong, 3-6 cm. long, entire or a few with 1-2 lateral lobes; panicles numerous, leafy throughout; involucre campanulate, 4-5 mm. high, tomentose, a few of the outermost bracts foliaceous, the inner broadly ovate or nearly orbicular, with very broad brown-scarious margins; fls. 6-20, all fertile; achenes narrowly turbinate, glandular. B. C. to Calif., e. to Neb. (Peck).

ASTER

A. multiflorus=**A. ericoides** L.

A. commutatus T&G. Less common than the last; two vars. also occur.
Pubescence of stem spreading or reflexed ..... var. *crassulus* (Rydb.) Blake
Pubescence of stem appressed
Bracts of involucre unequal and imbricate ..... var. *polycephalus* (Rydb.) Blake
Bracts of involucre subequal ..... *A. commutatus*

A. alpinus L. Forbidden Plateau, V. I. (W. Newton, DB); otherwise known only from the Rocky Mt. region

A. brachyactis Blake
A. angustus (Lindl.) T&G
Annual; stems erect, branched, glabrous, 2-6 dm. high; leaves narrowly linear, 3-10 cm. long, glabrous, slightly ciliolate on the margins; involucre 6-8 mm. high, 8-10 mm. wide; bracts in 2 series, almost equal, *linear, acute; ray fls. hardly exceeding the pappus or reduced to the tube.* Alta. to Wisc., s. to Mo. and Utah. Windermere, Columbia Valley (PM).

A. frondosus (Nutt.) T&G. Very close to the preceding; bracts in 2-4 series (usually 3), linear-oblong, oblong, or spatulate, obtuse. Locally abundant in wet saline soil, Penticton (DA); Osoyoos (DA).

A. ciliomarginatus Rydb. Very close to **A. Fremontii**; differs chiefly in the broader involucral bracts (linear-lanceolate to lanceolate instead of narrowly linear) and the outer ones not wholly green. Mont.-Colo.-U.-B. C. (Rydberg). Anahim Lake, Chilcotin (DA).

A. meritus A. Nels. Hope-Princeton road; Yoho; Columbia Valley. Very close to **A. Richardsonii.**

Plant 2-4 dm. high; pubescence of stem and involucre short; involucre about 8 mm. high by 10 wide ..... *A. meritus*
Plant 1-3 dm. high; pubescence of stem and involucre long-villous; involucre about 10 mm. high by 15 wide ..... *A. Richardsonii*

A. Sayianus Nutt. Hardly distinct from **A. modestus** but stem usually puberulent throughout; leaves clasping with small auricles. Cranbrook (DA); Emerald Lake, Yoho (DA); Field (Ulke).

A. scopulorum Gray
Ionactis alpina Greene.
Stems clustered from a branching woody base, simple, sparsely tomentose, 7-12 cm. high; leaves numerous, crowded, linear-oblong, sessile, 1-nerved, spinose-mucronate, scabrous and sometimes tomentose, 5-12 mm. long; *heads solitary, long-peduncled;* involucre 9-11 mm. high, the bracts numerous, in about 3 series, closely imbricated, lanceolate, acute, ciliate, broadly scarious-margined; rays 6-20, deep violet, 8-12 mm. long; *pappus double,* the outer bristles short and sometimes squamellate; achenes silky-pubescent. Rocky Mt. region to Ore. Lake McArthur, Yoho (Farr).

BIDENS

Both **B. frondosa** L. and **B. vulgata** Greene are credited to B. C. by recent authors.

Outer involucral bracts 6-8; disc-corollas orange; inner mature achenes 6-9.5 mm. long; awns 3-5.5 mm. long (mostly 3-4 mm.) ..... *B. frondosa*
Outer involucral bracts 10-16, foliaceous, longer and wider than in the last; disc-corollas yellow; inner mature achenes mostly 8-12 mm. long; awns usually 4-5.5 mm. long ..... *B. vulgata*

BIGELOVIA=CHRYSOTHAMNUS

B. graveolens Gray=**C. nauseosus** (Pall.) Britt. Our common form, widely distributed in the southern Dry Belt, is subsp. **albicaulis** (Nutt.) H&C with twigs and leaves densely white-floccose-tomentose; involucre white-woolly, the bracts acute.
B. viscidiflora (Hook.) DC=**C. viscidiflorus** (Hook.) Nutt. Much less common than the last; Osoyoos (DA).

CARDUUS=CIRSIUM for our sp.

C. Hookerianum Nutt., usually given as an alpine plant, occurs as a weed of cultivated land along the road from Cariboo Highway to Canim L. and at Bridge L., Cariboo (DA).
C. Kelseyi Rydb. differs from the above in having the leaves not crisped and with very short or no lobes; green above; numerous parallel spines along the margins. Montana. Elko (PM).

CENTAUREA

C. diffusa Lam. Annual; stems 1-6 dm. high, angled, much-branched almost from the base; leaves grey-green, hispid, and somewhat tomentose, the basal long-petioled, lanceolate to obovate, 1-2 pinnately-parted, the uppermost much reduced and entire; *heads very numerous,* solitary at the ends of the branches; *involucre narrowly cylindric, about 8 mm. high, bracts light straw-colored, membranous, fimbriate on the sides and with a strong terminal spine 3-4 mm. long; fls. few, yellowish-white,* rarely pink. Native of s.e. Europe and s.w. Asia. Vernon, Oyama and Penticton in the Okanagan; abundant and spreading in the Grand Forks district.

C. maculosa Lam. (SPOTTED KNAPWEED). Biennial or perennial, pubescent to glabrate; stems usually much-branched, 3-9 dm. high, the branches ascending, wiry; *leaves pinnately-parted into linear segments* (terminal one usually broader) or the upper linear and entire; involucre ovoid, 10-12 mm. high; *bracts with a black pectinate tip,* the inner entire or merely erose; corollas pink to purplish-red, rarely whitish, the outer falsely radiate. Introd. from Europe. Roadsides and waste ground, becoming frequent; very abundant at Balfour and Bonnington in West Kootenay.

C. nigra L. Perennial; scabrous or pubescent; stems stiff, branched, 3-6 dm. high; lower and basal leaves oblong to spatulate, acutish, entire, denticulate or dentate *but not pinnatifid,* 7-15 cm. long, long-petioled; upper leaves oblong or lanceolate, sessile, entire or nearly so; involucre 10-15 mm. high, subglobose; bracts closely imbricated, *tipped with brown fimbriate appendages* or the uppermost merely lacerate; corollas rose-purple. Introd. from Europe. Sidney, V. I. (PM); Nakusp (DA); Vancouver (DA).

C. repens L. (*C. picris* Pall.). (RUSSIAN KNAPWEED). *Perennial by strong, black, deep-seated, extensively creeping rootstocks;* stems 5-10 dm. high, branched, tomentose or glabrate; basal leaves 5-15 cm. long, lobed or pinnatifid; stem-leaves mainly sessile, linear-lanceolate, *entire;* heads terminal; involucre 9-13 mm. high, ovoid, *greenish to stramineous, outer bracts with an orbicular body and a membranous acute tip; inner ones lanceolate, the tip acuminate, pilose;* corollas rose-colored. Introd. from Asia, presumably with seed of Turkestan alfalfa. A pernicious and persistent weed; recorded from several places in the Dry Belt; Notch Hill; Okanagan; Keremeos; Grand Forks; Creston; Cariboo; chiefly, as yet, in small and scattered infestations.

COREOPSIS

C. tinctoria Nutt. Annual; stem 4-10 dm. high, glabrous; leaves 1-2-pinnately divided into linear, mostly entire segments, or the uppermost linear and entire, glabrous; involucres about 7 mm. high and 10-15 wide; outer bracts oblong, reflexed in fruit; inner ovate or lance-ovate acute; rays 6-10, 8-12 mm. long, yellow or with a brown base or brown all over; *achenes wingless.* Man.-Tex.-Ariz.-B. C. (Rydberg). Forms of this are commonly cultivated.

COTULA

C. coronopifolia L. Frequent near the coast in the Vancouver area; Lulu Is.; West Vancouver; Ladner; Colebrook; Elgin; Port Moody.

CREPIS

C. nana Richards. Garibaldi (DA); Tenquille (DA); Kaslo (DA); Yoho (Ulke); Paradise Mine, Windermere (PM).

C. runcinata T&G. Cranbrook; Canal Flats; Windermere; in DA.

C. occidentalis Nutt. Quite widely distributed in the Dry Belt, n. to Hanceville, Chilcotin (PM).

C. intermedia Gray. Most, if not all, B. C. records of this sp. are referable to **C. atribarba** Heller, which is distinguished from it by the achenes being green (rarely brownish) and strongly attenuate at the apex; lobes of leaves linear or narrowly lanceolate, 0.5-2.5 mm. wide, falcate, mostly entire. Two subsp. occur:—

Stems 15-30 cm. high; heads 3-18 in an infl.; involucral bracts bearing black glandless setae throughout their length ..... ssp. *typica*
Stems 30-70 cm. high (avge. 35-50); heads 10-30 or more in an infl.; involucral bracts without setae or these few and confined to the tips of the bracts ..... ssp. *originalis* Babc. & Stebb.

C. modocensis Greene. *Perennial;* stems 5-45 cm. high, stout, glabrate or tomentose, at least the basal part with spreading glandless setae; basal

leaves 7-25 cm. long, glabrate or tomentose and generally setose along petiole and midrib, deeply pinnatifid with lanceolate, toothed or pinnatifid segments, the ultimate segments or teeth acute or acuminate, mucronate; *heads 1-10 in an infl.; involucre cylindric, 11-21 mm. high*; inner bracts 8-18, glabrate or finely tomentose; outer lanceolate or narrowly deltoid, the longest one-half to two-thirds the length of the inner; florets 10-60; achenes 7-12 mm. long, *blackish or greenish, distinctly attenuate or beaked at apex*, with about 10 rather indistinct ribs. B. C. to Mont., s. to Colo. and Calif. The form recorded from B. C. (Spence's Bridge) by Babcock and Stebbins is subsp. **rostrata** (Cov.) Babc. & Stebb. Crawford Bay (DA).

C. nicaeensis Balb. Introd. from Europe. May occur in B. C. Very close to **C. capillaris.**

Involucres 5-8 mm. high, 3-4 mm. wide at middle; receptacle glabrous; achenes brownish-yellow to pale brown or dark brown, 1.5-2.5 mm. long, narrowly ribbed ..... *C. capillaris*

Involucres 8-10 mm. high, 4-6 mm. wide at middle; receptacle ciliate; achenes golden-brown, 2.5-3.8 mm. long, broadly ribbed ..... *C. nicaeensis*

C. tectorum L. Annual; stem 3-10 dm. high, erect, simple or branched; basal leaves up to 15 cm. long by 4 cm. wide, lanceolate to oblanceolate, acute, denticulate to pinnately parted, petioled, glabrous or puberulent; *stem-leaves mostly linear*, sessile, auricled; heads usually many, corymbose; involucre cylindric-campanulate, up to 9 mm. high; outer bracts 12, about one-third as long as the inner, subulate; inner bracts 12-15, acuminate, lanceolate, *pubescent on inner face;* receptacle very finely ciliate; achenes 2.5-4.5 mm. long, *dark purplish-brown,* fusiform, *rather strongly attenuate,* scarcely beaked, 10-ribbed. Introd. from Europe. Roadsides, waste ground, grain-fields, etc.; very abundant around Soda Creek, extending n. beyond Quesnel and s. to Williams Lake and across the Chilcotin to Redstone; Windermere (DA); Vanderhoof, lat. 54 (DA).

C. vesicaria L. subsp. **taraxacifolia** (Thuill.) Thell.

C. taraxacifolia Thuill.

Annual or biennial, rarely perennial; stem 1-8 dm. high, stout, erect, more or less tomentose, hispid and purple near the base, branched; basal leaves narrowly oblanceolate to ovate or spatulate, obtuse or acute, denticulate, dentate, runcinate-pinnatifid, or lyrately pinnately-parted, petioled, finely pubescent on both sides; stem-leaves similar or sessile, acute or acuminate, nearly entire to pinnately parted, the middle ones auriculate-clasping; heads erect, numerous; involucre cylindric-campanulate, *8-12 mm. high*; outer bracts 5-12, lanceolate or ovate-lanceolate, scarious-margined; inner 9-13, lanceolate, obtuse, tomentose, often glandular; *achenes pale brown, 4.5-9 mm. long, attenuate into a slender beak as long as or a little longer than the body.* Native of w. Europe and n. Africa. Abundant on roadsides, waste ground, hay-fields, etc., in the Nanaimo district of V. I.; Mayne Is. (PM).

ERIGERON

6. **E. flagellaris** Gray. Abundant along Cariboo Road at least as far north as Williams Lake.

9. *E. filifolius.* There appears to be some doubt still as to the correct name of this yellow-fld. sp. Peck gives **E. peucephyllus** Gray; St. John *E. linearis* (Hook.) Piper. See also no. 13.

11. **E. pumilus** Nutt. Common in the Dry Belt; Tranquille; s. Okanagan; Grand Forks.

13. *E. linearis*=**E. filifolius** (Hook.) Nutt.

14. **E. caespitosus** Nutt. Wilmer, Columbia Valley (Ulke).

20-21. **E. salsuginosus** (Richards.) Gray seems to be generally accepted as including *E. loratus* Greene, *E. callianthemus* Greene and *E. membranaceus* Greene.

22. **E. ramosus** (Walt.) B.S.P. Alberni and Chemainus, V.I.; Lytton; Nelson; Prince George.

27. **E. macranthus** Nutt. Kamloops (DA); Lac la Hache (PM).

E. annuus (L.) Pers. Resembling **E. ramosus** but usually taller and stouter and leaves more strongly toothed. Annual; sparsely hirsute; stem 6-10 dm. high, leafy, branched above; leaves lanceolate to oblanceolate or the lowest broadly ovate, coarsely crenate or dentate or the upper entire; lower stem-leaves, including petioles, 6-12 cm. long; heads numerous; involucre hemispheric, sparsely pubescent, 3-5 mm. high; rays numerous, white or tinged with blue, 4-6 mm. long; pappus double, the outer of short slender scales. Introd. from Europe. West Vancouver; Whonnock; Sardis; Hope; all DA.

E. divergens T&G. Annual or biennial, canescent throughout; stems several, branched from the base, 12-40 cm. high; basal leaves spatulate or oblanceolate, petioled, 2-6 cm. long, usually entire; stem-leaves linear; sessile; heads numerous; involucre 4-5 mm. high, bracts with thin scarious tips; rays numerous, blue, lilac, or purplish, 5-6 mm. long; pappus scanty and fragile, double, the outer somewhat squamose. Mont.-Tex.-Calif.-B. C. (Rydberg); Kelowna (A. H. Brinkman).

E. unalaschkensis (DC) Rydb. Yoho (Miss Farr). Very close to **E. uniflorus** L.

Rays 2-3 mm. long by 0.5 mm. or less wide ..... *E. unalaschkensis*
Rays about 6 mm. long by 1-1.5 mm. wide ..... *E. uniflorus*

FILAGO

White-woolly herbs with the general characters of *Gnaphalium* but the outer flowers of the head subtended by, and often enclosed in, chaffy scales; pappus capillary, but often wanting in the outer flowers.

F. arvensis L. Resembling **Gnaphalium palustre** but outer fls. as above; annual; 10-35 (-45) cm. high; heads clustered in a narrow panicle; achenes about 0.6 mm. long; pappus very fugaceous, that of the inner fls. with several, of the outer with one row of bristles. Introd. from Europe. Roadsides, waste places and pastures; Erickson (DA); betw. Moyie and Cranbrook (W. B. Johnstone, PM; DA).

GALINSOGA

Annual branching herbs with opposite, mostly petiolate, dentate or entire leaves and small peduncled heads of both tubular and ray flowers, terminal and in the upper axils. Involucre hemispheric or broadly campanulate, its bracts in 2 series, ovate, obtuse, membranous, striate, nearly equal or the outer shorter. Receptacle conic or elongated, with thin chaff subtending the disc flowers. Ray-flowers 4-5, white or red, pistillate, fertile, short. Disc-flowers yellow, perfect, corolla 5-toothed. Achenes angled or outer ones flat. Pappus of disc-flowers of several short laciniate or fimbriate scales, that of the rays of a few short bristles or none.

G. ciliata (Raf.) Blake
G. parviflora Cav.

Sparsely pubescent, 3-9 dm. high; leaves ovate, petioled, coarsely crenate-serrate; rays white. Native of tropical Am. widely introd. in N. Am. Langley (DA); Agassiz (H. Groh); New Denver (DA).

GNAPHALIUM

G. obtusifolium L.
G. polycephalum Michx.

Resembling **G. microcephalum,** especially in its strong balsam-fragrance. Erect woolly annual, 3-9 dm. high; leaves *lanceolate,* tapering at base, undu-

late, *not decurrent, glabrate and commonly dark green above;* heads clustered at the summit of panicled-corymbose branches, ovoid-conical before expansion, then obovoid; bracts whitish, ovate or oblong, obtusish; perfect fls. few; pappus bristles distinct. Eastern N. Am.; near Wilmer, Columbia Valley (Ulke).

GRINDELIA

All forms of the common and variable sea-coast sp. are referable to **G. stricta** DC. (*G. oregana* Gray).

G. collina Henry=**G. stricta** var. **collina** (Henry) Steyerm. Quadra Is. (DB).

G. lanata Greene=**G. stricta** var. **lanata** (Greene) Steyerm.

G. integrifolia DC. is an inland sp. of s. Wash. and Ore.

G. nana Nutt. is widely distributed in the Interior at least as far north as Hanceville, Chilcotin (DA).

var. *discoidea* Gray=var. **columbiana** Piper. Grand Forks (DA).

var. **integerrima** (Rydb.) Steyerm. with involucral bracts only 5-7 mm. long and the revolute tips only 0.4-1.5 mm. long, occurs in the Columbia Valley (Windermere, PM).

HELIANTHUS

H. Cusickii Gray. *Perennial* with a thick fleshy root; stems usually several, 3-12 dm. high, erect or decumbent; *leaves usually all opposite, linear-lanceolate, 3-nerved,* hirsutulous; heads solitary at ends of branches; involucre 12-15 mm. high; bracts linear-lanceolate, attenuate, rather loose, hirsute; disc yellow; rays about 25 mm. long. East of the Cascades; Ore.-Wash.-Ida.-B. C. (Rydberg).

H. Maximiliana Schrad. *Perennial* from a thick rootstock; *leaves and stem very scabrous;* stem 5-30 dm. high; *leaves mostly alternate,* subsessile, *lanceolate to linear,* entire or denticulate, 5-15 cm. long, *1-ribbed;* heads few to many; involucre about 15 mm. high; bracts lanceolate-subulate, long-attenuate, strigose-canescent; disc yellow. Man.-Tex.-Wyo.-B. C. (Rydberg); Griffin Lake (DA); Victoria (PM. Cat.).

HIERACIUM

H. umbellatum L. is European; the American sp. formerly considered identical is **H. scabriusculum** Schw.

H. Scouleri Hook. is a more southern sp.; the one under this name is probably **H. albertinum** Farr.

H. albertinum Farr. Stems mostly solitary and simple, 2-7 dm. high, villous with long white or yellowish hairs; basal and lower stem-leaves similar, 10-25 cm. long, linear-lanceolate, entire, tapering into a winged petiole; upper leaves 3-8 cm. long, lanceolate, sessile; infl. from loosely corymbose to contracted or sometimes elongated; involucre 8-10 mm. high, sparingly to copiously villous with white, yellowish or blackish hairs from black papillose bases; ligules 7-14 mm. long. Alta. to Ore. and U. Flagstone (DA).

H. Rydbergii Zahn. (*H. griseum* Rydb.). Resembling the last but stem-leaves more numerous and gradually reduced upwards; involucre blackish and glandular with a few scattered long hairs at base, at least when young. East of the Cascades, Alta.-Wyo.-U.-B. C. (Rydberg).

H. Pilosella L. (Mouse-Ear Hawkweed). Plant with slender leafy stolons; leaves oblong-lanceolate to spatulate, 3-7 cm. long, tapering to winged petioles, sparingly long-bristly on both surfaces, green above, tomentose beneath; scape 5-20 cm. high; head solitary. Introd. from Europe; occasional in lawns, etc.; Vancouver (DA); V. I. (PM).

H. aurantiacum L. (Orange Hawkweed). Readily distinguished by the large heads of *orange-red* fls.; heads several on a scape 2-6 dm. high; stolon-

iferous. Native of Europe. Commonly cultivated as an ornamental and occasionally escaping; well-established along roadsides near Pemberton village, forming large patches.

IVA

I. axillaris Pursh. Not common; Kelowna (PM); Nicola Valley (Quilchena, DA; Douglas Lake, PM).

I. xanthifolia Nutt. *Annual; stems 5-20 dm. high,* simple; leaves opposite or upper alternate, 6-12 cm. long on petioles nearly as long, ovate or the lower cordate, acuminate, dentate; *heads about 2 mm. wide, numerous, in dense terminal and axillary panicles.* Sask. to Wash., s. to U. and N. M.; probably introduced in B. C.; railway grade, Merritt (GVC); cult. ground, Monte Creek, Kamloops (DA; PM).

JAUMEA

Perennial herbs with narrow, entire, opposite leaves connate at the base. Heads medium sized, radiate, solitary and terminal on the branches. Involucre narrowly campanulate, bracts broad, the outer short and fleshy. Receptacle conical, naked. Ray-flowers pistillate, short and inconspicuous, yellow. Pappus none. Achenes linear, 10-nerved.

J. carnosa (Less.) Gray. Stems succulent, weak, erect or ascending from prostrate stems of preceding year, mostly simple, 10-25 cm. high; leaves linear-spatulate, obtuse, 2-4 cm. long; involucre about 1 cm. high; rays 9-12, narrow, 2-3 mm. long. Salt marshes along the coast, B. C. to Calif. Saanichton Spit, V. I. (PM).

LACTUCA

L. spicata (Lam.) Hitchc.=**L. biennis** (Moench.) Fern.

L. muralis (L.) Fresn. Annual or biennial, glabrous; stem slender, 3-9 dm. high; leaves thin, glaucous beneath, pinnately parted usually into alternate large and small segments, the terminal one very large and broadly triangular, all segments, except the smallest, irregularly lobed; panicle large, spreading, with very numerous small heads, each with 4-5 fls.; involucre 8-10 mm. high, of usually 5 linear inner bracts and 1-3 small outer ones; ligules yellow; pappus white; achene black, ribbed, with a slender beak less than half its length. Introd. from Europe. Abundant on s. V. I.; Saturna Is.; Vancouver, Crescent, and Garibaldi on the mainland. An aggressive weed in shady ground, crowding out the native woodland flora. First recorded in 1919.

LEONTODON

L. nudicaulis (L.) Banks. Introduced from Europe.

Involucre 11-14 mm. high; achenes very rough.....*L. hastilis* var. *vulgaris*

Involucre 8-10 mm. high; inner achenes rough, outer smooth; *L. nudicaulis*

Both occur on V. I., **L. nudicaulis** being the commoner.

MATRICARIA

M. suaveolens (Pursh) Buch.=**M. matricarioides** (Less.) Porter.

M. inodora L. (Scentless Mayweed). Resembling **Anthemis Cotula** but not strong-smelling and receptacle without bristly chaff. Introd. from Europe; near Victoria (DA).

MICROSERIS

M. nutans (Gey.) Schultz

Ptilocalais nutans (Gey.) Greene

Scorzonella nutans Gey.

Nicola (PM); Botanie (DA); Flying U, Cariboo (U); Newgate (DA).

PETASITES

P. palmata (Ait.) Gray. Resembling **P. speciosa** (a plant of the coast region) but leaves usually smaller (commonly 10-15 cm. wide) and without the flattened appressed bristles on the upper surface characteristic of that sp.; fls. nearly white, the marginal ones of the pistillate heads ligulate. B. C., e. of the Cascades, to the Atlantic Coast. Columbia Valley; Yoho; Revelstoke; Cariboo; common in lat. 54.

Henry's transfer of **P. palmata** var. **frigida** Macoun (*P. corymbosa* [R. Br.] Rydberg) of the Rocky Mt. region to **P. speciosa** is not in accordance with the range of these species.

P. vitifolia Greene. Leaf-blades green above, white-tomentose beneath, broadly cordate or deltoid-reniform, 5-12 cm. long by 8-20 wide, with 2 or more lateral veins arising from the base, usually 5-lobed one-third to one-half to the midrib, the basal lobes usually deeply 2-cleft and the terminal one 3-5-lobed; lobes coarsely and irregularly dentate; scape 2-3 dm. high; involucre over 1 cm. high, glandular and floccose. Man. to Alta; summit of highway between Francois and Ootsa Lakes, lat. 54 (DA).

P. vulgaris Hill. Leaves orbicular or reniform, up to 36 cm. wide, margin irregular dentate but the body not lobed, green and nearly glabrous above, thinly tomentose beneath; corolla purplish, rays absent. An Old World sp. introd. by the Japanese who use the leaf-stalks as a vegetable. Well-established and spreading by strong creeping rootstocks in the vicinity of former Japanese dwellings; gives indication of becoming a persistent weed.

PICRIS

(*Liguliflorae*)

Coarse rough-bristly annuals or biennials. Heads many-flowered. terminating leafy stems. Outer bracts loose and spreading. Flowers all ligulate, yellow. Achenes with 5-10 rugose ribs. Pappus of 1-2 rows of plumose bristles.

P. hieracioides L. Biennial, much-branched, 3-9 dm. high; leaves lanceolate or oblong-lanceolate, dentate or nearly entire, the basal narrowed into petioles, often 15 cm. long, those of the stem mostly sessile and smaller; heads many; involucre 8-16 mm. high, outer bracts linear, subulate, spreading, inner linear-lanceolate, acuminate; pappus copius, nearly white. Introd. from Europe; "rare; in waste place near Wilmer", Columbia Valley (Ulke).

PSILOCARPHUS

P. elatior Gray. Amstrong (U).

P. tenellus Nutt. Stems slender, often becoming glabrous, diffusely branched from the base, prostrate, forming mats 1-3 dm. across; leaves spatulate, narrowed to the base or petioled, 5-10 mm. long; heads many, spherical, sessile in the forks and at the ends of the branches, closely subtended by several leaves, 4-6 mm. high. West of Cascades, B. C. to Calif. Victoria district (PM. Cat.).

RATIBIDA

Annual, biennial or perennial caulescent herbs. Leaves alternate, pinnatifid, with narrow divisions. Heads radiate, long-peduncled, many-flowered. Involucral bracts in 2-3 series. Ray flowers neutral; ligules yellow or partly brown at the base, rarely wholly purple-brown, spreading or drooping. Receptacle columnar to subulate. Disc-flowers perfect, fertile, more or less enclosed by the chaffy scales; corolla grey or yellowish, almost without a tube. Achenes flattened, broad-margined or winged, deciduous with the scale. Pappus of 1-2 teeth or absent.

R. columnifera (Nutt.) Woot. & Standl.
Lepachys columnaris (Sims) T&G.
Perennial from a tap-root; stems often several, 3-6 dm. high, strigose; leaves pinnately divided, the divisions of the stem-leaves 5-9, oblong to linear, entire or rarely 2-3-cleft; involucral bracts oblong, 5-8 mm. long, soon spreading; ligules yellow (in var. **pulcherrima** T&G wholly or partly purple-brown), 1-3 cm. long; receptacle in fruit 2-4 cm. long. B. C. to Sask., s. to Ariz. and Tex. Locally abundant near Wardner (W. B. Johnstone, PM; DA) and occasional between there and Cranbrook.

RUDBECKIA

R. hirta L. Comox, V. I. (PM. Cat.); Armstrong (U); Vernon (U); Golden (DA); Field (Ulke).

SAUSSUREA

S. densa (Hook.) Rydb. Field (Ulke); Paradise Mine, Windermere (PM).

SENECIO

3. **S. pauciflorus** Pursh. Mt. McGillivray, Lillooet (PM); Forbidden Plateau, V. I. (U).
5. **S. discoideus** (Hook.) Britt. Garibaldi; Mt. Apex, Penticton; Nelson; in DA.
13. **S. canus** Hook. Monte Creek (DA); Fairmont, Columbia Vy. (DA); Yoho (Ulke); Lac la Hache (PM).
var. **Purshianus** (Nutt.) A. Nels. (*S. Howellii Greene*). Windermere (PM); Yoho (Ulke); Mt. McLean, Lillooet (PM).
15-18. *S. exaltatus* Nutt. and *S. Elmeri* Piper are not considered distinct from **S. integerrimus** Nutt. *S. lugens,* at least for our area, is probably the same thing.
17. *S. atriapiculatus* Rydb.=**S. columbianus** Greene.
24. **S. pseudaureus** Rydb. is doubtfully distinct from the eastern *S. aureus* L. The commonest and most widely distributed sp. east of the Cascades, extending at least as far north as lat. 54 (Burns Lake, DA).
25. *S. Balsamitae* Nutt.=**S. pauperculus** Michx.
26. **S. multnomensis** Greene. Field (Farr); Revelstoke (DA); Quesnel (PM).
S. Farriae Greenm. Close to **S. pseudaureus** but more dwarf and the lower leaves less sharply toothed. *Stem 1-3 dm. high,* branched from near the base; leaves thin, *reduced upwards,* lower ones with winged petioles; blades ovate to obovate, 1-4 cm. long, rounded at apex, *crenate to subentire;* stem-leaves lyrate or irregularly pinnatifid, the upper bract-like; heads about 1 cm. high; involucre campanulate, sparingly tomentose at the base, bracts often reddish tipped; achenes glabrous. Mts. Alta. to Wash. Chilcotin (PM).
S. viscosus L. Resembling **S. sylvaticus** but densely viscid-pubescent and strong scented; annual; 15-60 cm. high; outer bracts of involucre 1-3, not black-tipped; rays minute, bright yellow; achenes glabrous. Ballast heaps and waste places; introd. from Europe. Prince Rupert and Terrace (H. Groh).
S. sylvaticus L. may be slightly glandular-pubescent, but not "viscid" as given in Henry. This sp. is common in the Vancouver district and on V. I.

SOLIDAGO

S. corymbosa Nutt. There appears to be some doubt about the valid name of this plant. **S. multiradiata** Ait. var. **scopulorum** Gray seems to be preferred by recent authors, but *S. ciliosa* Greene is also used in the same sense. Rydberg distinguishes them as species;—

S. scopulorum (Gray) A. Nels. Heads 7-9 mm. high; inner bracts linear-lanceolate, of about same length as fls. and pappus; plant 2-3 dm. high.

S. ciliosa Greene. Heads 5-7 mm. high; bracts lanceolate, the inner shorter than the fls. and pappus; plant usually less than 2 dm. high.

S. decumbens Greene. Common east of the Cascades, especially around Cranbrook and up the Columbia Valley, and extending north at least as far as Fort St. James (lat. 54½, DA).

S. canadensis L. var. **gilvocanescens** Rydb.

S. gilvocanescens (Rydb.) Smythe

Differs from typical **S. canadensis** in being lower (3-6 dm. high) with infl. small and dense, but chiefly in stem and leaves being canescent-puberulent on both sides. Between Kimberley and Fairmont (DA).

S. missouriensis Nutt. var. **extraria** Gray.

S. concinna A. Nels.

Differs from typical **S. missouriensis** in having stouter stems and larger heads (involucre 6-7 mm. high as against 3.5-5 mm.); leaves broader and nearly or quite entire. Field (Ulke); Wilmer, Columbia Valley (Ulke).

S. serotina Ait. var. **salebrosa** Piper.

S. salebrosa (Piper) Rydb.

Differs from typical **S. serotina** in having the upper surface of leaves strongly scabrous and veins of lower surface puberulent; involucre only 3-4 mm. high.

S. occidentalis (Nutt.) T&G

Euthamia occidentalis Nutt.

Glabrous or nearly so; stems strongly striate, freely branched, 3-20 dm. high, from a branching rhizome; *leaves linear, 3-nerved, entire,* 4-13 cm. long; *infl. a corymb;* involucre 4-5 mm. high, bracts in 3-4 series, lance-linear, acute, the tips glutinous; *ray-fls. more numerous than the disc-fls.* (12-20 and 8-14 respectively); achenes pubescent. Wet places, Alta. and B. C. to N. M. and Calif. Common from Summerland to Osoyoos (DA); Kinbasket L., Big Bend Highway (DA).

SONCHUS

S. arvensis L. is now a widespread and troublesome weed as far north as lat. 54 (Prince George; Smithers). In addition to the typical form var. **glabrescens** Gunth., Grab. and Wimm., with involucres and peduncles glabrous, also occurs.

STEPHANOMERIA

S. tenuifolia (Torr.) H. M. Hall

S. minor Nutt.

Ptiloria tenuifolia (Torr.) Raf.

Common in the southern Interior from Cisco (DA) to the Columbia Valley and north at least to Clinton (PM).

TANACETUM

T. vulgare L. is now extremely abundant as a weed of roadsides and waste places in parts of the Lower Fraser Valley as far east as Yale; not yet common east of the Cascades; Boswell, Kootenay L. (DA).

TARAXACUM

T. erythrospermum Andrz.=**T. laevigatum** (Willd.) DC. Widely distributed in the Interior but still uncommon at the Coast; Garibaldi (DA).

T. scopulorum (Gray) Rydb.=**T. lyratum** (Ledeb.) DC. Garibaldi (U); Yoho and Horsethief Ck., Columbia Valley (Ulke).

T. officinale Weber=**T. palustre** (Lyons) Lam. & DC. var. **vulgare** (Lam.) Fern.

TOWNSENDIA

Biennial or perennial caulescent or scapose herbs. Leaves alternate, entire, often crowded. Heads rather large, radiate; involucre hemispheric; bracts imbricate, herbaceous, with scarious margins. Ray-flowers pistillate, white, rose, or violet. Disc-flowers perfect. Achenes of the disc-flowers compressed, those of the rays commonly angled. Pappus a single series of rigid bristles or short scales.

T. exscapa (Richards.) Porter. Perennial from a strong woody root, acaulescent; leaves silky-strigose, 2-5 cm. long, linear to linear-oblanceolate; heads sessile amongst the leaves; involucre 1 cm. high, 1-3 cm. wide, bracts narrowly lanceolate in 4-5 series; rays white or purplish; achenes hirsute; pappus of disc-fls. twice as long as the achene, those of the ray-fls. shorter. Sask. to Mont., s. to Tex. and N. M. Columbia Valley (Invermere and Windermere, PM); Marysville, Cranbrook (U).

TRAGOPOGON

T. pratensis L. and the closely related **T. dubius** Scop. probably occur widely in the Interior. However, they have only been distinguished in recent years and older observations unaccompanied by specimens are without value.

According to H. Groh (1) **T. dubius** tends to have a more southern range, a conclusion supported by the limited material in DA, specimens from Vancouver, Kamloops, Penticton and Nelson being this sp. while those from Chilcotin and Cariboo are **T. pratensis.** Both sp., however, were found by the writer at Prince George, lat. 54, in 1946, one or other (sp. undet.) having been first observed there in 1943.

The following separation characters (best observed on fresh material) are given by Groh;—

Stems tending to purplish especially at the nodes; leaf-tips usually curved or curled; peduncle little thickened upwards, often flexuous; involucral bracts equalling the florets, broad, tinged purple; corolla canary yellow; fruit, including beak, mostly under 20 mm. long; *T. pratensis*

Stems seldom purplish except at base; leaf-tips straight and grass-like; peduncles thickened upwards, stiff, fistulose; involucral bracts longer than the florets, narrow, without purple; corolla sulphur yellow; fruit, including beak, mostly over 20 mm. long ..... *T. dubius*

XANTHIUM

X. canadense Mill. The sp. common at Penticton and Osoyoos is **X. italicum** Mor.

X. spinosum L. with nodes armed with 3-forked spines, leaf-blades densely white-pubescent beneath, and body of fruit 9-12 mm. long, is recorded from Nanaimo, V. I. (PM. Cat.).

(1) Groh, H. Tragopogons as weeds in Canada Sci. Agric. **26:** 1-6. (1946).

Excluded Species

This list included doubtful determinations and species which have been collected in B. C. but which are not known to have established themselves. The selection of the plants placed in the latter group is probably rather arbitrary. A good many species have been given in the body of the work on the strength of one collection, but these are either native plants whose known range is such that an extension into B. C. may be reasonably expected, or aliens whose history elsewhere in North America renders it probable that they will be found again from time to time, and perhaps ultimately succeed in establishing themselves.

Agrostis longiligula Hitchc. Listed in PM. Cat. from V. I.; Hitchcock gives the range as s. Ore. and Calif.

Briza media L. European; sometimes cult. as an ornamental. Nanaimo, V. I., Macoun's Cat. 1888; Alberni, V. I., 1917 (PM).

Eragrostis hypnoides (Lam.) BSP. Que. to Wash. and southw. Credited to B. C. by Rydberg but not by Hitchcock. No specimens in our herbaria.

Melica Geyeri Munro. Alberni, V. I. (PM. Cat.); a sp. of s. Ore. and Calif. (Hitchcock).

Mibora minima (L.) Desv. (*M. verna* Beauv.) Collected by Macoun at the Dominion Experimental Station, Saanichton, V. I., in 1914 (PM). Not reported since.

Panicum huachucae Ashe var. **fasciculatum** (Torr.) F. T. Hubb. Collected at Agassiz and Sicamous by M. O. Malte (DB). Que. to Minn. and Neb. and southw.

Panicum tenue Muhl. (*P. unciphyllum* Trin.). Recorded from Renfrew district, V. I. (PM. Cat.) on authority of Rosendahl & Butters. A sp. of N. C. and Fla.

Setaria verticillata (L.) Beauv. Found in a garden at Kamloops (GVC) in 1933. An European sp. extensively introduced into the U. S. but not otherwise recorded from B. C.

Carex castanea Wahl. Recorded as *C. flexilis* Rudge from Ucluelet, V. I. (PM. Cat.); "Introduced from the East with Cranberry plants".

Hemicarpha micrantha (Vahl) Pax. Collected at Cadboro Bay, Victoria, by M. O. Malte in 1921 (PM) but not found since. This area is now intensively built up. Wash. to Calif.

Juncus brevicaudatus (Engelm.) Fern., a sp. of eastern N. Am., recorded from Ucluelet, V. I. (PM. Cat.).

Polygonum humifusum Pall. A sp. of eastern Asia, collected by J. Macoun on ballast at Nanaimo, V. I. in 1887 and 1893. Groh. Can. Weed Surv. 3rd. Report (1946).

Corrigiola littoralis L. A sp. of western Europe. A few plants of this annual have appeared for three successive years just outside the Government Fumigation Station for nursery stock, Vancouver. Possibly introd. as seed in soil adhering to roots of imported nursery stock.

Paronychia Jamesii T&G. Recorded by T. Ulke from near Wilmer, Columbia Valley. Neb. and Colo. to Tex. and N. M.

Cerastium tomentosum L. Commonly cultivated and occasionally escaping; Kamloops (DB).

Caltha palustris L. Given in PM. Cat. from Comox and Mt. Arrowsmith on V. I. and Q. C. I. (Osgood). The Comox plant is in PM and is *C. asarifolia* DC., a sp. still regarded by some authors as a var. of *C. palustris.*

Ranunculus hebacarpus H&A. On ballast at Nanaimo; Macoun V: 298 (1890). Wash. to Calif.

Ranunculus recurvatus Poir. Collected at Tranquille by E. W. Tisdale (DB). N. S. to Man. and southwards.

Berberis vulgaris L. An escape at Ladner, where several hedges of it had been planted. Eradicated on account of its role in spreadng grain rust.

Papaver Rhoeas L. Native of Europe. Collected by J. W. Eastham at Goldstream and Nanaimo on V. I. in 1939 (DA). Abundant on bank of road at former site.

Arabis Breweri Wats. Given in PM. Cat. from Tzouhalem and Strathcona Park, V. I. A sp. of s. Ore. and Calif. only in Rollins Monog. 1941.

Bunias orientalis L. Botanie, Lytton (PM). Native of e. Europe and Asia Minor.

Reseda lutea L. Native of Europe. Collected by Macoun at Sicamous in 1889 and Victoria in 1908 (both Can.). Groh. H. Can. Weed Survey, 1st. Report (1942).

Crataegus oxyacantha L. and **C. monogyna** Jacq. Commonly cult. at the Coast and occasionally spontaneous.

Potentilla recta L. Native of Eurasia. Union Bay, V. I. (PM. Cat.); Crescent (DA).

Spiraea salicifolia L. Eurasian; cultivated. Ucluelet, V. I. (PM. Cat.).

Astragalus leucopsis T&G. A Californian sp. recorded from Nanaimo, V. I. (PM. Cat.).

Lathyrus nevadensis Wats. Cowichan Lake, V. I. (PM. Cat.). Ore. and Calif.

Medicago orbicularis (L.) All. Native of Europe. Esquimalt, V. I. (PM. Cat.).

Melilotus indica (L.) All. Native of Eurasia. Nanaimo, V. I. (PM. Cat.).

Trifolium fucatum Lindl. A Californian sp. recorded from Victoria in 1885. Macoun's Cat. III: 506.

Trifolium longipes Nutt. "Along the southern boundary of B. C. (Watson)" in Macoun's Cat. 1: 104; also credited to B. C. by more recent authors. No B. C. specimens in our herbaria. Wash. to Ida. and s. to Calif.

Erodium moschatum Willd. Native of Europe. Esquimalt, V. I. (PM. Cat.).

Oxalis oregana Nutt. "Woods on the Lower Fraser (Cowley)" Macoun's Cat. 1: 92 (1883). No recent records and no specimens in our herbaria.

Euphorbia vermiculata Raf. (*E. hirsuta* [Torr.] Wieg.). A sp. of eastern N. Am. Sproat Lake, V. I. (PM. Cat.).

Althaea hirsuta L. Native of Europe. Collected by R. Connell on waste ground at Metchosin, V. I. in 1924 (PM).

Hypericum canadense L. Native of e. N. Am. Sproat Lake, V. I. (PM. Cat.).

Hypericum virginicum L. Native of e. N. Am. Recorded as *Elodea campanulata* Pursh from Ucluelet, V. I. (PM. Cat.).

Rhexia virginica L. Eastern N. Am. A number of plants were found in flower in 1937 on a blueberry farm on Lulu Island, Vancouver, where blueberry plants had been imported from the Atlantic States (DA). In a search two years later no plants were found.

Godetia gracilis Piper. A sp. of Ore. and Calif. but credited to V. I. by Piper.

Godetia hispidula Wats. A Californian sp. found on ballast at Nanaimo, V. I. in 1887. Macoun's Cat. V: 323.

Carum oreganum Wats. A sp. of Ore. and Calif. Victoria (PM. Cat.).

Dodecatheon frigidum C&S, a northern sp., has been reported from V. I. and Q. C. I. but the records seem doubtful. The Mt. Arrowsmith plant collected by Macoun in 1887 (Cat. V: 340) is in Can. Nat. Herb. and is considered by A. E. Porsild to be a depauperate *D. pauciflorum.*

Lysimachia terrestris (L.) BSP. A sp. of eastern N. Am. Ucluelet, V. I. "Introduced with Cranberry plants from the east". J. M. Macoun, Ottawa Nat. 26: (1913).

Phacelia hispida Gray. A sp. of Calif., Ariz. and Utah found on ballast at Nanaimo, V. I. by Macoun in 1893. Groh, Can. Weed Surv. 2nd. Report (1943).

Phacelia tanacetifolia Benth. A Calif. sp. collected by Groh at Montigny, Kamloops district, in 1934 (l. c.).

Borago officinalis L. European and cult. Found at Williams Head near Victoria. Ann. Rept. of PM. for 1920.

Cryptantha intermedia (Gray) Greene. " . . . probably introduced in ballast, vicinity of Victoria (Macoun)". I. M. Johnstone "N. Am. species of Cryptantha" 1925. A Californian sp.

Trigonotis peduncularis (Trev.) Benth. Native from extreme s.e. Europe through middle and n. China to Japan. Collected at Nanaimo, V. I.

by J. Macoun in 1893; probably introduced in ballast. I. M. Johnston, Contrib. Gray Herb. 70: 46. (1924).

Hyoscyamus niger L. Native of Europe and cultivated as a medicinal plant. Found at Salmon Arm in 1923 (J. W. Gibson); one plant appeared spontaneously in the garden of H. B. Leech, Vernon, in 1944 (DA).

Linaria Elatine (L) Mill. Native of Europe. Saanich, V. I. (PM).

Linaria spuria Mill. Native of Europe. Duncan, V. I. (PM).

Asperula odorata L. Native of Europe; often cultivated. A garden escape at Victoria.

Galium verum L. A garden escape at Victoria. Native of Europe.

Githopsis specularioides Nutt. Native of s. Wash. to Calif. Recorded from Sooke, V. I. Ann. Report of PM for 1926.

Jasione montana L. European and commonly cult. Golf-links, Qualicum, V. I. (PM); spontaneous and persisting for several years on site of Jericho Air Station, Vancouver, but now probably destroyed (DA).

Centaurea paniculata L. Native of southern Europe. Victoria (PM. Cat.).

Helianthus scaberrimus Ell. Native of central and south-eastern N. Am. Fairmont, Columbia Valley (PM).

Hieracium murorum L. Native of Europe. Collected at Agassiz in 1923 by W. B. Anderson (PM).

Psilocarphus oreganus Nutt. An inland sp. of Wash. and Ida. to Calif. Saanichton, V. I. (PM. Cat.).

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